TELEPHONE ENGINEER

Volume XVI CHICAGO, DECEMBER, 1918 No. 6

Automatic Equipment

City Exchange — Country Phones — Toll Lines

have just been ordered by the

Marion County Telephone Company

OF MARION, OHIO

Surrounded on all sides by Automatic installations, the Officials and Directors of this Company have had every opportunity to study this equipment in operation. Their investigations have led to the usual result.

While at the Chicago Convention visit rooms 1708-1709-1710, and see what the Marion Company has now ordered.

Automatic Electric Company

CHICAGO

If They're Good Enough for Them

OSHKOSH telephone construction tools are in constant use by hundreds of telephone companies. Repeat orders prove they are giving perfect satisfaction.

The line includes practically everything in telephone construction.

Write *now* for catalogue No. 55.

They're Good Enough for You

OSHKOSH MFG. CO.
Oshkosh, Wis., U. S. A.

Cross Ringing Again On Your Harmonic Party Lines?

Your Pole Changer Needs Better Watching

If you had a HOLTZER-CABOT FREQUENCY METER to check its cycles, you could keep them so tuned that they would not get out of step.

THE HOLTZER-CABOT FREQUENCY METER is the best instrument for you because it RECORDS EVERY ALTERNATION.

The meter reads directly upon a dial, in either cycles per minute or cycles per second.

Because of the permanent record it gives, this meter is far ahead of any that depend upon reeds or electrical tuning devices. It is the most accurate Frequency Meter on the market today.

The Holtzer-Cabot Electric Company
CHICAGO, ILL. BOSTON, MASS.

¶ W. R. Pearce, General superintendent of the Alberta Government Telephones, Edmonton, Alberta, Canada, sees that more than two hundred of his executives read every issue of ***Telephone Engineer.***

¶ "A man cannot be a good telephone executive unless he keeps abreast of the times by reading the trade paper of the field," says Superintendent Pearce.

¶ "Our company invites the reading of ***Telephone Engineer,*** by offering to pay one-half of the subscription price of the magazine—the employe paying the other half. Reading keeps our men abreast of the times."

¶ "I am surprised more telephone companies do not follow our plan and improve the efficiency of their organization."

¶ ***Telephone Engineer is willing to help by quoting a special subscription price to companies anxious to improve their service by making readers of their employes.***

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Forty-second St. and Broadway
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ESTABLISHED 1902

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VOL. XVI CHICAGO, DECEMBER, 1916 NO. 6

Things the Convention Might Discuss

MERGERS between Independent and Bell telephone companies continue to be reported in dispatches that come to this office almost daily. Occasionally the contracting parties are courteous enough to express a desire for the sanction of the United States department of justice.

But that is rare. Ordinarily none of those involved seem to know that the permission of the department is one of the rules of the game. In spite of the trade papers (and we still claim to reach all these telephone men who want to sell out as well as those who are willing to stay in) there seems to be a lot of Independent operators who never heard of the Kingsbury letter, the anti-trust laws, or the attorney general of the United States. Possibly they have merely forgotten the existence of those somewhat negligible factors in the presence of more pressing and more active affairs.

At any rate, if the convention wishes to discuss mergers it will have some material, with the accent on the adjective. No doubt it will want to discuss mergers, and it is unfortunate that discussion has no effect upon the situation. Like most objectionable conditions, only action can affect it.

So, as we are only discussing discussions just now, we will leave the subject; with, however, the final comment that it appears to be up to the association at least to take a positive stand on the subject—for or against. This somewhat brusque comment is not intended as a reflection upon those sincere members and directors who have consistently and persistently fought against mergers, but it is a criticism of those who, for one reason or another, are inclined to quibble the association into passivity and inaction.

The convention might discuss, if it would, the purchasing of Bell equipment by its members.

Men like to retain the right to buy where they please. Your strongest advocate of the open market is he who can buy cheapest from the seller to whom his fellows object. But there is no answer to the argument that the word "Independent" in the telephone business means "Anti-Bell" and nothing else. Only the ordinary and average gift of logic is needed to carry the idea to its natural conclusion.

Of course a resolution to the effect that all members of the Independent association buy all their equipment from Independent dealers would precipitate a rumpus. We would not advocate such a step by any means. For all we know, it might be illegal. Lacking a legal education and having a delightfully hazy idea of law in general, we merely advance this idea in a spirit of mischief.

On the other hand, we have for discussion the fact, amply demonstrated, that the Western Electric Company is still trying to sell its goods to Independent operators when it had apparently promised it wouldn't. On this subject we refuse to get excited, because we never considered the promise seriously. Rather let us say, to give the W. E. its due, we never considered that it had promised not to sell to Independents. Blame the buyer, not the seller, if there is any blame to be placed. If we made a fuss about every salesman that solicited us, we would not have time to edit Telephone Engineer.

The convention might discuss physical connection of all telephone lines. There is a

subject that is legitimate and important. It is something the Independents want, and the people want, and the Bell does not want. The Bell has the weak end of the argument. The Independents could get universal physical connection in a hurry if they showed as much spirit and aggressiveness in going after it as the Bell does in fighting it whenever even a suggestion of it appears.

Lack of results for the toll line committee resulted in its quitting the job—and it can hardly be blamed for getting disgusted. But the fact that the committee was stalled along by its pleasant and diplomatic contemporaries does not close the case. The Independents still have that toll line connection coming to them, according to the terms of the agreement. A little more discussion on that subject would do no harm.

If telephone men heard the word discussion as often as editors do they would become a bit calloused to its charm. As a preliminary it helps a lot, of course; but unless it results in action it is little more than a wholesome mental exercise, useful only for starting the intellectual digestive juices.

We can have only praise for the splendid technical discussions of the convention; and under technical we include all the subjects that enter into telephone operating, from buying poles to paying dividends. Any telephone man who misses any part of these discussions is deliberately throwing away an opportunity to make himself a better operator and a more efficient human being in his particular department of life.

For the exhibits of manufacturers and dealers also there are none but good words. The operators who picture a saleseman every time they think of exhibits should remember that out of the factories come practically all the improvements on which the progress of the art depends.

Without intelligent, enthusiastic manufacturers, who think of the welfare of the telephone business before they think of profits, there could have been no Independent telephony, no telephony at all.

These things, without the politics and the diplomacies of competition, are the mainsprings of the convention. It is regrettable that such a big, strong, clean, virile industry as this should be afflicted with conditions that divert the time and attention of its people from public service to self-defence. But, faced by the necessity, we could wish that the defence were a little more positive and aggressive, perhaps a little more pugnacious than it appears to be.

Independent telephone men are not the fighters they used to be. They do just as much discussing as ever, but they are inclined to let it go at that. (Here and there, of course, are exceptions; we all can name them without giving them embarrassing publicity by listing them in these pages.)

Sometime during this convention, without a doubt, the subject of fighting is bound to arise.

Let it, then, be more than a fight of words among friends. Let it be the rehearsal of a battle that will result in advance, advantage and accomplishment for the Independent telephone industry.

Interpreting the Common Carrier Clause

THE interstate commerce act in respect of its application to telephone and telegraph traffic is obscure because the act itself was intended to apply to railroads, and its amendments naturally have been built upon the original foundation. Such amendments as have definitely named telephones and telegraphs as subject to their regulations have been actuated by specific cases.

The question of interchange of traffic between companies, or physical connection of lines, has not arisen in any of these cases, and therefore is not directly considered in the act as it now reads.

The interpretation of the physical connection clauses of the act depends upon the definition of the term "common carrier." That telephones and telegraphs have been regarded as common carriers within the meaning of the act is a matter of record. As a matter of informal opinion, there is no question that practically all the provisions of interstate commerce

regulation may readily be applied to telephones and telegraphs without the perversion of logic.

An amendment calculated specifically to embrace wire companies in the regulations thrown about the rail companies in their interchange of business would, of course, solve the intercommunication problems of the Independent telephone operators. It is improbable that such an amendment could be secured, however, by very reason of the probability of existing jurisdiction.

There would be no disposition to make new laws for a situation which, for all evidence to the contrary, is already covered by present laws.

Even if it were possible to secure an amendment defining the interrelation of telephone companies, such an amendment would tend to broaden the jurisdiction of the Interstate Commerce Commission and increase the sum total of regulation—a consummation not considered desirable by most utility operators. What is wanted, therefore, is not new laws but an interpretation of existing laws. Very good authorities have expressed the opinion that the "Act to Regulate Commerce, as amended June 29, 1906, April 13, 1908, and June 18, 1910," should properly be construed to confer the rights and privileges of interchange of traffic by wire companies.

This interpretation is, indeed, quite plain to those who wish so to construe it—and, unfortunately, equally obscure to those who wish it obscured.

In what little hearing there has been on this subject, those who oppose interconnection of telephone lines have based their interpretation of the act upon the fact that in its definite provisions it uses language that is applicable only to rail business, and where the telephone is specifically mentioned, no connection is established between the telephone clauses and the railroad clauses.

Section 1 Paragraph 1 of the act, as amended in 1910, declares "That the provisions of this act shall apply to telegraph, telephone and cable companies engaged in sending messages from one state * * * to any other state * * * who shall be considered and held to be common carriers within the meaning and purpose of this act." That, as we read it, is a definite classification of telephone interstate lines, as common carriers, subject to all the rules that govern common carriers within the limits of the difference between the transportation of physical objects and the transmission of messages. Section 3, Paragraph 2 says in part "Every common carrier subject to the provisions of this act shall, according to their respective powers, afford all reasonable, proper, and equal facilities for the interchange of traffic between their various lines * * * ." The word "traffic" is as applicable to telephone operation as to railroad operation, and common to both. The first paragraph of section 3, which has to do with preferential discrimination and which we will not quote, has already been held (Conference Ruling 305, April 1, 1915) to apply to telephone and telegraph companies.

It seems obvious that the second paragraph is equally applicable, and that there was not intention to withhold a ruling to that effect.

The Commission is given power in Section 15, Paragraph 3, to establish "through routes and joint classifications * * * whenever the carriers themselves shall have refused or neglected to establish voluntarily such through routes or joint classifications or joint rates." The language of this paragraph is that of the railroad. Whether it is deemed adequate, under Section 1 Paragraph 1, to cover the establishment of telephonic "through routes and joint rates" remains to be adjudicated.

The relation of the act to wire companies is not intentionally vague, and the Interstate Commerce Commission would doubtless welcome a definition of its powers in this direction. This is a duty that rests entirely upon the Independent telephone operators—either as individuals or (preferably) through their association.

The Bell companies will not undertake the task, because they are satisfied to have the question maintain its obscurity.

It is most desirable that proper legal steps be taken at once to obtain a definite interpretation of the act, and we hope to see the association attack the problem, if not during convention, then during the next year.

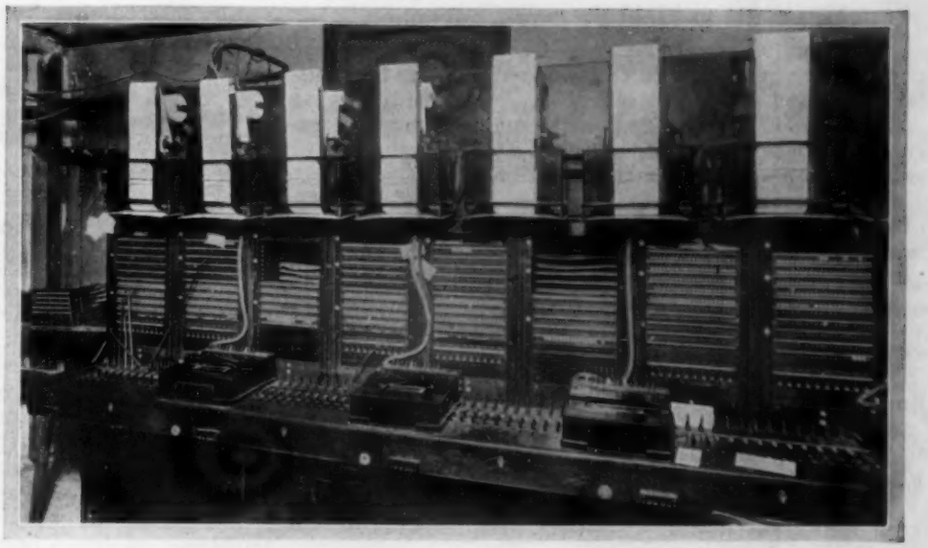
To meet increasing traffic conditions in Dorchester, Mass., various expedients have been devised by the New England Telephone and Telegraph Company to perform the required work, and yet not seriously interfere with service. The growth of the present trunk switchboard is from left to right, and in order to increase the operating capacity of this board, it is necessary to reverse the manner of growth. The manner in which the work has been done will be seen in the illustration showing the suspension chains sustaining the weight of the cables in layers corresponding to each group of multiple jacks. That takes all unnecessary strain from the skinners, yet allowing sufficient space for workmen to make the terminal taps to the multiple jacks. The chain shown in the illustration is made up of welded links large enough to allow a ¼-inch rod to pass freely through the mesh. The chains are securely fastened to the roof irons of each section, both in front and rear of multiple cables and the rods are passed through the proper links to raise the multiple cables to a sufficient height.—Telephone Topics.

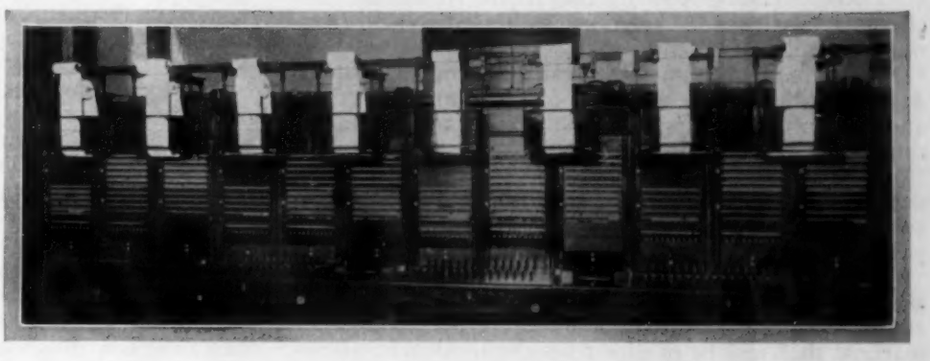
Stage Directing by Telephone.—In the Granville Barker outdoor productions of the Greek plays in the various colleges throughout the country and in public stadiums, the Stage Director would be too conspicuous at his usual place in the wings (if there were any), so he is placed at a telephone in some out of the way corner and sends his directions to the players by telephone.—The Telephone Review.

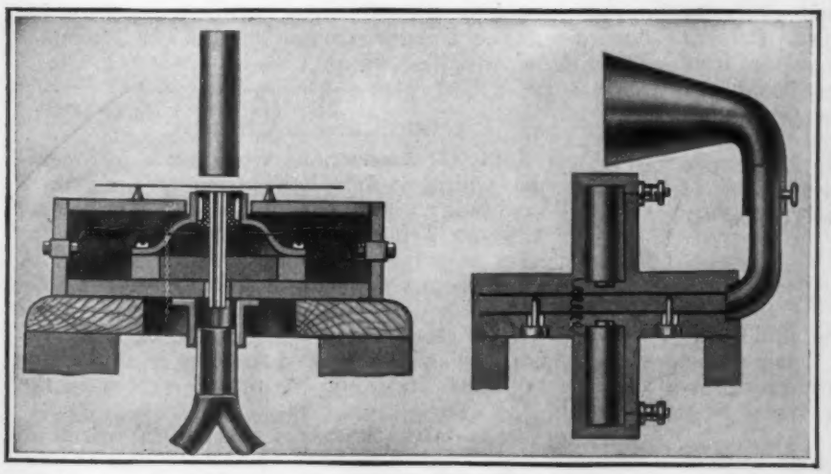
Cable Vault in the Basement of the New Center Exchange of the Tri-State Telephone and Telegraph Company, Minneapolis, Minn. The Story of the New Exchange and Its Equipment Is Told on Another Page.

STORIES IN PICTURES OF TELEPHONE PRACTICE AND PROGRESS IN ALL PARTS OF THE WORLD.

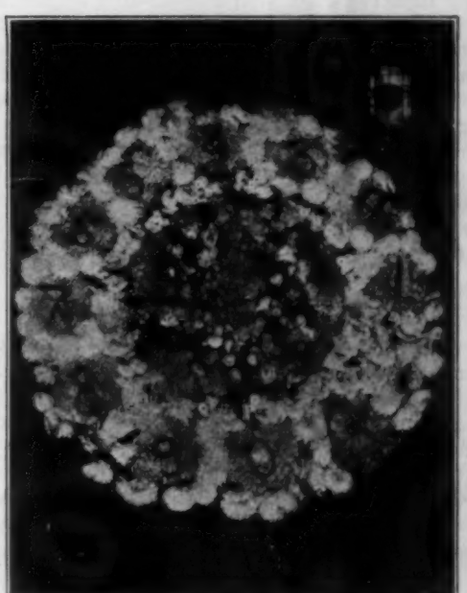
At the Hotel Baltimore in Kansas City a peculiar condition arose. The original installation of three two-panel sections, three-panel multiple of No. 10 X switchboard equipped for 500 lines and 20 two-way trunks, was made in 1910. The switchboard was designed to grow from left to right. In January, 1915, this equipment was moved to another room on the same floor, another position and turning section being added to the right-hand end, leaving a turning section at both ends. Several months later the hotel company decided to have installed a telautograph system. In order to make room for the telautograph transmitters on the key-shelves it was decided, as a temporary measure, to remove three or four pairs of cords from each position. This was done and the telautograph instruments installed. It, however, proved to be a very unsatisfactory arrangement, because of the reduced number of cords per position, and the telautograph instruments extended four or five inches above the key-shelves and were very much in the operators' way, as can be seen in the picture. It was then decided that it would be necessary to install a one-panel telautograph section at the right of each position. To do this it was necessary to have the switchboard room enlarged, remove the turning section from the left-hand end, extend the line multiple four panels, rewire the trunk circuits and then separate the sections and place the telautograph sections in between them. All this was done in six hours, between 1 and 7 a. m., Sunday. In order to handle the job in this length of time, it was necessary to do a lot of preliminary work. The hotel company enlarged the room, the left hand turning section was then removed, first moving all equipment that was in it to the right hand turning section, slack was then spliced in all the miscellaneous and power wiring between sections, the trunk circuits rewired and the additional line multiple jacks spliced in. In order to separate the sections it was necessary to remove all of the multiple jacks and cables from the switchboard. To do this and keep the cables straight and protect the jacks, two two-inch conduits were placed the full length of the switchboard in the rear about even with the roof. To these conduits, short lengths of sprocket chain was fastened about twelve inches apart, and this child of necessity proved to be a device that saved much time and trouble. That night when the multiple jack and cables were removed, they were lifted out, raised and suspended by the chains with pins made of No. 6 iron wire slipped through the links. —Southwestern Telephone News.







In Europe there has recently been developed a system of telegraphy which makes it possible for any station to communicate with any other station on the same line, without disturbing communication between the remaining stations. The receiving instrument of a given station is affected only by an alternating current of given frequency, while its transmitting apparatus is capable of generating an alternating current of any frequency necessary. It is said that the best practice is to employ frequencies between 600 and 1,100 per second. The receiving apparatus employed with the new system is in the form of a mono-telephone, or a telephone attuned to a given frequency. In essential principle the system consists of a steel membrane measuring from one to two millimeters in thickness, carried by three points placed 120 degrees apart. A strong magnet placed below the membrane, as shown in the first instrument depicted in the accompanying illustration, has a vertical core the axis of which passes through the center of the membrane. The magnet is found to a total resistance of from 200 to 400 ohms. The magnet core is hollow and is connected below with a tube whose two openings consist of flexible tubes terminating in receivers which the operator attaches to his ears. The use of head receivers may be avoided by the installation of a loud speaking telephone of the type shown in the second view. It is formed of two horizontal membranes mounted closely together, the lower supported on three hollow columns and the upper by three points which project from the axles of these hollows and pierce the lower membrane. Each membrane is under the influence of a separate magnet.



Floral Dial, four and a half feet in diameter, a gift to the Tri-State Telephone and Telegraph Company, Minneapolis, Minn., from President Joseph Harris of the Automatic Electric Company, Chicago. It adorned the main lobby of the new Center exchange on the night of the cut-over and for several days following that event, the story of which is told on another page. The automatic dial was made up of chrysanthemums and roses.

Automatic to Hold Factory Convention

Automatic telephone men from all parts of the country are planning to lay aside their own particular cares and duties for a few days and, gathering at Automatic Electric Company's factory in Chicago early in December, will consider some of the larger subjects connected with their business.

The occasion will be the regular annual meeting of the Ohio Automatic Telephone Association, to which all automatic operating organizations are invited to send representatives. The sessions will occur at the same time as, but so arranged as not to conflict with, the United States Independent Telephone Association Convention, December 5, 6, 7 and 8.

The following outline includes some of the more important questions that will be considered:

"New Developments in Automatic Telephony," which will deal with the latest advance made in all branches of the art.

"Rural Telephone Net-works" will bring up the very important matter of giving first-class service to rural subscribers.

"Recent Developments in Private Automatic Exchanges," with special reference to long distance transmission and traffic standards.

"Latest Developments in Operating Methods," dealing with the use of girls for routine inspections and the extension of systematic routine inspections to the subscriber's equipment.

"The Selling of Automatic Telephone Service," a paper dealing with a very important and interesting subject and having special reference to recent campaigns."

As will be seen from the above brief outline, the program promises to bring up matters of very general interest and value, the aim having been to include material that will be of direct benefit to all who attend the meetings.

The sessions last year were very generally attended and were a most substantial success. Present indications point to an even more representative attendance, and the committee in charge has every confidence that the 1916 meeting will set a new standard of helpfulness in this most unique co-operation plan, which has gone far toward welding the entire automatic field into a unified whole, every part of which aids and draws assistance from all the other units.

A. T. & T. Financing

Directors of the American Telephone and Telegraph Company November 22 authorized the issuance of $40,000,000 of capital stock for subscription by present stockholders, according to a report from New York.

The new issue is said to be a portion of the authorized capital of $500,000,000 of which $380,477,100 is outstanding. This would bring the outstanding capital up to about $420,477,100.

The new issue is to be offered to present stockholders at par, $100, it is reported, in the ratio of one new share for every ten of the old now held.

The A.T.& T. directors have also decided the present offers a favorable opporunity to finance maximum construction and refunding requirements for all of 1917 and 1918. With this object in view, the directors have authorized, in addition to 10 per cent of the new stock to be offered shareholders at par, an issue of $80,000,000 5 per cent thirty year collateral trust bonds. These bonds have been sold to a Boston-New York banking syndicate and by them will be offered to investors. The bonds are not a part of the present collateral trust issue, of which $78,000,000 are outstanding but are a new issue.

How About It?

A most cursory glance at the employe body of any large corporation at once reveals two classes, the contented and the ambitious. Ordinarily contentment and ambition are not directly opposing terms. But in this case one may be placed against the other as contrasting the satisfied plodder with the man who is not content to remain in his present position but who is constantly striving to fit himself for something better.

You know the mechanical workers, men who go ahead and do their bit and perhaps do it gvery well, but who make no effort at self-improvement. They plod along dreaming of promotions and better days, apparently unconscious of the opportunity for mental improvement afforded by the many, many hours of their marginal time. And then they are disappointed and resentful when promotion passes them by to crown the more worthy.

And you know really ambitious men, men who capitalize their spare hours and make them really valuable by the opportunity afforded for study and for general self-improvement. You see them gradually evolve from the contented, plodding, mechanical worker class to the aggressive, thinking and doing class—the class that absolutely forces recognition and preferment.

It might be well to stand aside for a moment and watch ourselves go by. In fact, one might profitably ask himself this question: If I were boss and I were one of my employes, would I promote me, knowing myself as I do? That is a mighty pertinent question to ask oneself. And the answer might have a tremendous influence on one's life for genuine good.—*The Mountain States Monitor.*

Election Calls in Chicago

Over 3,100,000 connections were made by operators of the Chicago Telephone Company up to 7 o'clock Wednesday night, November 8.

The Chicago *Tribune* switchboard started in at 8:30 Tuesday morning doling out election returns. A woman called up at that hour to ask the returns. By 1 o'clock hundreds of women had called up to find out who was the victor. At 4 o'clock, the hour of the closing of the polls, calls started to come in at the rate of 8,000 an hour, and kept on until 3 o'clock in the morning.

Two hours later the wires started to warm up again. People seemed to have the hunch that the accepted defeat of President Wilson was not true. The operator on night watch sent out a distress call. Soon a force of six operators was on the job.

"We never had so many calls in the history of the *Tribune* switchboard," said Miss Anna Garrow, chief operator. "During the day we received long distance calls from places as far distant as Fort Worth, Tex.; Cedar Rapids, Ia., and Moberly, Mo."

Our grocer likes us for paying cash; but he gives our neighbor a cigar when he settles at the end of the month.

Preparation for Biggest Convention

United States Independent Telephone Association Ready for the Year's Event—Hotel La Salle, Chicago

IN a few days what promises to be the largest Independent telephone convention ever held will be convened in Chicago; not only does this promise to have the largest attendance, but in a variety of ways it promises to be the most important because of different problems that are now before the industry. The program committee have endeavored to arrange a program in which every employe and stockholder who can possibly attend the convention, will find something that will be of practical interest and value to them.

Registration, Room 1758. *Exhibits,* 17th Floor. *Accounting Committee,* Room 1755. *Traffic Committee,* Room 1756.

TUESDAY, DECEMBER 5.

Meeting of Board of Directors in the Morning.

2 P. M.—Invocation, Rev. Kirk Waldo Robbins, Pastor Ravenswood M. E. Church.

Address of Welcome—William R. Moss, Chicago.

Response—William Fortune, Indianapolis, Ind., President Indianapolis Telephone Company.

President's Address—C. Y. McVey, Cleveland, Ohio.

Address—Hon. E. B. Fisher, Grand Rapids, Mich., Chairman of Board.

Address—Hon. Charles E. Elmquist, St. Paul, Minn., member of Minnesota Railroad and Warehouse Commission and Chairman of Executive Committee of the National Association of Railway Commissioners.

Applied Enthusiasm—Dellwyn Stratton, Wynona, Ohio, manager Wynona Central Telephone Company.

Report of Officers.

Report of Committees.

Appointments of Committees.

Announcements and Adjournment.

WEDNESDAY, DECEMBER 6.

On Wednesday morning at 10:00 o'clock there will be a meeting of the State Association officials in room 1811. C. J. Garlow of Nebraska is chairman and C. C. Deering of Des Moines, secretary. The two subjects which they will discuss are—

1. Reports of Class D companies to Interstate Commerce Commission.
2. Distribution of commission decisions to State Association officials.

Wednesday afternoon at 2:00 o'clock will be a technical session. The subject to be considered will be "Transmission Line Interferences," in charge of L. E. Hurtz of Lincoln, Nebraska, who is chairman of the Outside Plant Committee. After Mr. Hurtz presents this subject there will be a discussion by C. C. Deering, Des Moines, Iowa; B. H. Brooks, Columbus, Ohio; W. C. Polk, Kansas City, Mo.; R. L. Barry, St. Paul, Minn.; W. H. Hay, Pittsburgh, Pa.

Legal Phases of Transmission Line Interferences—H. L. Beyer, Grinnell, Iowa.

The National Safety Code—Dr. E. B. Rosa, Chief Physicist, Bureau of Standards, Washington, D. C.

Good Operating—W. S. Vivian.

The election of a board of thirty-one directors will take place on this day.

THURSDAY, DECEMBER 7.

Thursday morning at 10:00 o'clock traffic conference in the east room, Mezzanine floor, in charge of Frank V. Newman, chairman of Traffic Committee. The Traffic Sub-Committee who have charge of this program are:

George K. Gann, Lincoln, Nebr.

Q. E. Elwell, Columbus, Ohio.

H. E. Guillim, Kansas City, Mo.

The question for discussion will be "Standard Long Distance Telephone Operating Practices."

Thursday afternoon will be in charge of the Accounting and Commercial Committees. The subjects which they have so far announced are "Costs of Service," by George C. Mathews of Chicago, who for several years was identified with the Wisconsin Railroad Commission, and "Modern Accounting," by Arthur E. Anderson, professor of accounting Northwestern University.

Advertising—Roy D. Mock, Chicago.

Getting the Business from the Viewpoint of the Larger Companies—Rollo Stevens, Columbus, Ohio.

Thursday night will be the banquet. The principal address of the evening will be given by John D. Shoop, Superintendent of Schools, Chicago. The Bulah Buck Quartette Company has been engaged to furnish the entertainment for this evening.

FRIDAY, DECEMBER 8.

Friday will be given over largely to business sessions, with but two addresses: Rural Telephony in Europe and America, by Hon. Frank G. Odell, editor *Nebraska Farm Journal;* and Character Analysis of Your Man by a Practical Method, by Dr. J. M. Fitzgerald, Chicago.

In addition to the program, which will be added to and supplemented before the convention date, there are the following exhibits:

LIST OF EXHIBITORS

All Exhibits will be open mornings and closed afternoons.

Name of Company	Address	Room Number
Addressograph Company	901-911 West Van Buren street, Chicago, Ill.	1725
American Electric Company	State and Sixty-fourth streets, Chicago, Ill.	1702 and 1703
Andrae & Sons Company	Milwaukee, Wis.	1742
Barrett Company, The	10 South La Salle street, Chicago, Ill.	1741
Bowdle System of Accounting	Cerro Gordo, Ill.	1730
Chance Manufacturing Company	Centralia, Mo.	1749
Coffey System and Audit Company	Indianapolis, Ind.	1748
Cook, Frank B., Company	326 West Madison street, Chicago, Ill.	1706
Cox Lightning Arrester Company	Eaton, Ohio	1726
Electrical Contract Company	Genoa, Ill.	1700, 1701, 1739
Gund Manufacturing Company	Grinnell, Iowa	1728, 1729
Holtzer-Cabot Electric Company	La Crosse, Wis.	1760
Index Visible	6161 South State street, Chicago, Ill.	1752, 1753
Indiana Steel and Wire Company		
Illinois Electric Company	Muncie, Ind.	1727
Kellogg Switchboard and Supply Company	Chicago, Ill.	1740
Leeds & Northrup Company	Chicago, Ill.	1716, 1717, 1718, 1719
Leich Electric Company	4901 Stenton avenue, Philadelphia, Pa.	1736
McMeen & Miller	1454 Monadnock block, Chicago, Ill.	1704
Matthews, W. N., & Brother	507 South Clinton street, Chicago, Ill.	1743
Monarch Telephone Manufacturing Company	Ft. Dodge, Iowa	1711
National Carbon Company	Cleveland, Ohio	1744
Naugle Pole and Tie Company	5 South Wabash avenue, Chicago, Ill.	1746
Nungesser Carbon and Battery Works	Cleveland, Ohio	1723
Page & Hill Company	Minneapolis, Minn.	1720
Reliable Electric Company	411-417 South Sangamon street, Chicago, Ill.	1747
Roebling's, John A., Sons Company	165 West Lake street, Chicago, Ill.	1705
Standard Telephone Repair Company	Chicago, Ill.	1735
Standard Underground Cable Company	Pittsburgh, Pa.	1707
Automatic Electric Company	Chicago, Ill.	1708, 1709, 1710
Stewart Brothers	Ottawa, Ill.	1724
Stromberg-Carlson Telephone Manufacturing Company	Rochester, N. Y.	1712, 1713, 1714, 1715
Swedish-American Telephone Manufacturing Company	5253 Ravenswood avenue, Chicago, Ill.	1745
TELEPHONE ENGINEER	Monadnock building, Chicago, Ill.	1757
Telephony	Monadnock building, Chicago, Ill.	1759
Templeton, Kenly & Co.	Chicago, Ill.	1750
Thompson-Levering Company	323 Arch street, Philadelphia, Pa.	1751
Torrey Cedar Company	Clintonville, Wis.	1731
Utilities Indemnity Exchange	St. Louis, Mo.	1722
Volunteer Firemen Signal Company	119 Fifth street, S. E., Minneapolis, Minn.	1738
Warner Electric Company	Muncie, Ind.	1734
Warner Manufacturing Company	Beloit, Wis.	1737
White Company, The	Cleveland, Ohio	Writing Room

Illinois Independents Hold Meeting

With a twenty per cent increase in membership during the last year and a report from President E. D. Glandon of Pittsfield that business conditions in the Illinois field are better than ever before, more than 300 members of the Illinois Independent Telephone Association opened their twelfth annual convention at the Leland hotel, Springfield, Illinois, November 15, and continued for three days. Addresses were made by Mayor Baumann of Springfield, Manford Savage, Champaign; E. D. Glandon of Pittsfield, Bruce A. Campbell of East St. Louis and others.

Throughout the sessions a school of instruction for operators was held under the direction of W. S. Vivian, secretary of the United States Independent Telephone Association, and a wire chiefs' conference presided over by A. M. Haubrich of Rochester, N. Y.

Among the resolutions adopted were one favoring unlimited newspaper publicity to advertise the business and relations of the association to the public in order that the public may better co-operate with the independent telephone companies and another calling for a conference with the State Public Utility Commission in regard to obtaining a simpler form of accounting to the Commission the business of the telephone companies. The officers re-elected are: President, E. D. Glandon, Pittsfield; vice-president, Manford Savage, Champaign, and secretary-treasurer, B. F. Baker, LeRoy. The following were elected members of the board of directors: District No. 11, E. I. Barber, Aurora; District No. 13, L. E. Pitcher, Dixon; District No. 14, W. J. Maquiston, Monmouth; District No. 15, F. C. Woods, Galesburg; District No. 16, E. S. Sterrett, Henry; District No. 17, T. C. Ainsworth, Bloomington; District No. 18, E. O. Baker, Paris; District No. 19, Manford Savage, Champaign; District No. 20, J. W. Barrett, Havana; District No. 21, B. M. Burke, Carlinville; District No. 22, W. H. Bassett, O'Fallon; District No. 23, H. H. Knipe, Olney; District No. 24, J. C. Stuckes, Carmi; District No. 25, A. B. Minton, Murphysboro.

Springfield was again chosen as the convention city for 1917.

Minnesota Meeting in January

The executive committee of the Minnesota Independent Telephone Association has decided to hold the next annual convention at the Ryan Hotel, St. Paul, January 23, 24 and 25—a three-day meet.

An entire floor will be occupied by exhibitors and present indications point to an even larger attendance than last year, when ever two hundred registered. E. C. Kast, announces that his office will be pleased to make room reservations in advance.

Ohio Independents Meet

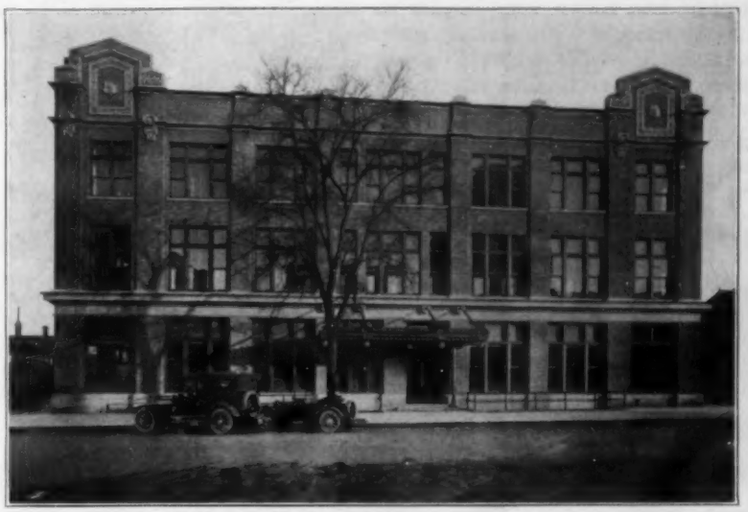
November 23 and 24 at the Hartman Hotel at Columbus, the Ohio Independent Telephone Association held their annual convention.

The first day of the convention was of general interest to directors and stockholders, while the second day was of interest to all.

Minneapolis is Cut Over

Big Tri-State System Becomes Automatic November 18

THE entire Minneapolis system of the Tri-State Telephone Company changed from manual to automatic the night of Saturday, November 18. The big cut-over had been awaited with a great deal of interest by the thousands of Tri-State subscribers in Minneapolis and it was only a few minutes after midnight before automatic calls began simmering through the various exchanges. The big new Center exhange, in the heart of the business district, found business particularly brisk right from the jump and there was little if any let-up. Traffic became very heavy soon after daylight and continued throughout the entire day.



Exterior View New Tri-State Center Exchange.

The first group of 25 telephones was cut-over by E. B. Fisher, board chairman of the United States Independent Telephone Association, who was present from Grand Rapids, the work beginning about 11:45. He was surrounded, at the time, by a group of interested spectators, including G. W. Robinson, president of the Tri-State Company; C. B. Randall, secretary and attorney; R. L. Barry, general superintendent; W. Lee Campbell, general superintendent of Automatic Electric Company, Chicago; J. M. Lockhart, Pittsburgh, Tri-State director; W. S. Vivian, Chicago, secretary United States Independent Telephone Association; O. Curtis, Minneapolis local manager, and various other department heads and employes.

The cut-over did not occupy longer than thirty minutes and is said to have been the largest and most successful of its kind in the history of automatic telephony. The following letter from W. Lee Campbell, general superintendent of Automatic Electric Company, to R. L. Barry, general superintendent Tri-State Telephone Company, has been received and adequately expresses the general sentiment:

Chicago, November 21, 1916.

DEAR MR. BARRY:—Upon my return to my office from the Minneapolis cut-over, I write to formally express my appreciation of the team work between your engineering and installation organizations and ours, which has made the completion of the great work for which we have been jointly responsible such a success and which has brought it to completion practically on scheduled time.

It is not unusual for a work of this magnitude to drag out far beyond the date originally set for finishing. I believe that you have the right to feel very much gratified from the results obtained in the Twin Cities.

Not only has this team work secured the physical and visible results desired, but I am sure that for many years to come

View of the Automatic Equipment of the Exchange.

it will bring up happy recollections in the minds of those who have the privilege to be members of the team.

With kindest regards to you and to the different members of your staff, whom it has been my peasure to meet, and who have been so hospitable to me during the progress of this work, I remain, Yours very truly,

W. Lee Campbell, General Superintendent.

The Minneapolis public has taken very kindly to the new equipment and has used it with a vengeance. Inter-city (St. Paul-Minneapolis) calls are now going through in wonderful time. Twelve to fifteen seconds completes the operation, including the time occupied by

The Center Exchange Battery Room.

the checking operator who asks the numbers of the both telephones in order to make out a charge slip.

The entire system is working with surprising smoothness and the minor trouble experienced the first few days of service is rapidly disappearing.

BEAUTIFUL CENTER EXCHANGE.

The new and beautiful Tri-State Center Exchange building, Sixth street and Third avenue South, Minneapolis, went into partial service Saturday, November 4, when the employes of the business departments moved from the old building, one block away. It was a big day for them, for they had waited patiently and expectantly for the word to pack up their goods and chattels and transfer to the new and more commodious quarters.

This new Tri-State exchange building is exceptional in a great many respects. It is absolutely modern, fireproof throughout and contains the largest automatic distributing rack in the world. The lot on which it stands is 66 by 150 feet and the dimensions of the building itself are 66 by 120 feet. It is of reinforced concrete construction, three stories in height with a full basement. Provision has been made for the erection of two additional stories and the concrete already has been poured for the fourth floor which will render necessary only the raising of the walls and roof when deemed advisable to enlarge.

The harmony and artistic beauty of the first floor, which harbors all of the local officials and the various business departments, is most striking. Visitors gasp with pleased amazement as they enter the portals of the main entrance which faces Third avenue. The floor of the spacious main lobby is of pure white tile, the counters, desks and other furniture of genuine British Honduras mahogany and the wainscoating and counter tops of marble.

The second floor, housing the terminal room, main frame, automatic racks, girls' rest room, hospital room and lockers is reached via the main stairway, finished in marble, or the elevator, the latter being automatically operated and requiring no attendant. The woodwork throughout both the second and third floors is fumed oak. On the third floor one finds an additional switchboard room which is being reserved for expansion purposes, a kitchen, dining room and a manual operating room which will handle information, private exchanges, pay stations, etc.

The "pent" house on the roof provides shelter for the elevator machinery and a modern ventilating system which keeps a supply of fresh air in constant circulation throughout the entire building. The basement contains a fine lounging room and lockers for men, general store rooms, cable vault, battery room, boiler and machine room and miscellaneous work rooms. The Webster modulation system of heating has been installed.

The exterior of the building is artistic in its every line. The trim is Bedford cut stone and terra cotta, the latter having been cut and manufactured to harmonize with the brick, which was selected.

This property, ready for occupancy and exclusive of telephone equipment, represents an investment of approximately $160,000. Downs & Eads were the architects and the James H. Brown Company, general contractor. The lighting system throughout the building is the semi-direct type, the first floor decorations and lighting fixtures being furnished by the William A. French Company. The entire structure, from the labor to materials required in construction, is "home product."

As a telephone building this new Tri-State structure is ideal in every particular. Every possible emergency has been taken into account and the Tri-State company feels that the progressive spirit which prompted the investment will be reflected in the friendly attitude of the Minneapolis public and particularly its subscribers in that city.

The old Center exchange building, now partially vacated, was first occupied in the fall of 1901. At that time it was believed the operating room was as large as would ever be required in the business area of Minneapolis. It measured approximately 50 by 75 feet.

As early as 1907 it became necessary, by reason of the growth of this exchange, to provide additional room in the building. This necessity resulted in the leasing of the two upper floors of the adjoining building, known as the Champ block. Into this new building were moved the operators' quarters.

The old structure has housed a busy operating exchange and has been occupied every minute of the

The Counting Room.

twenty-four hours a day and every day of the 365 in a year since that opening day in which thousands of Minneapolis citizens came to view the new modern, manual switchboard of the then Twin City Telephone Company. Many of the employes who were connected with the company at that time are still serving

the company in one capacity or another. It is estimated that the old exchange has originated, during its life, over 368,000,000 calls, 29,760,000 a year, or approximately 90,000 calls per day.

And so, the old Center exchange will soon be but a memory insofar as the Tri-State Telephone Company is concerned. It will be a memory, however, of days filled with sunshine and the nights with stars, for during all those years the company has grown wonderfully and prospered. The old building has not grown with the company, but its associations have become endeared to many who have labored beneath its roof.

The big switchboard it sheltered has been the connecting link for thousands of smiles, thousands of business transactions, thousands of tears and heartaches. Its scintillating lights ceased to flash the morning of Sunday, November 19, when the automatic machinery in the new building began to perform its functions. It has gone into the discard because something has been found which accomplishes the same results more accurately, more quickly and without annoying features.

Allegorical Play by Operators

"Any Girl," an allegory depicting the success of the girl who cultivates industry and the spirit of service, was given in a creditable manner by a cast composed of Dallas, Tex., telephone operators November 8. The play was part of the entertainment at an open meeting of the Telephone Society of Texas. Addresses were made by F. L. Devereux, auditor, and J. L. R. Van Meter, general superintendent of the American Telephone and Telegraph Company of New York. Music was furnished by the Telephone Society Orchestra under the direction of L. E. Adler.

The allegory brought out some clever work on the part of J. L. Hill, Jr., as "Luck" and "That-Something"; Amelia Zahrada as "Illusion," assistant to "Luck"; Grace Williams as "Bluff," a follower of "Luck"; Bertha Moore, as "Anygirl," any girl; and Gladys Rogers as "Poverty," a messenger of "That-Something." Others in the cast were Maggie Pilkington as "Industry," a messenger of "That-Something"; Minnie Bell Barker as "Selfishness," a follower of "Luck"; Virginia Redmund and Evelyn Singleton as "Spirit-of-Service," and Elizabeth Croft and Ruth Parnell as "Happiness" and "Prosperity," gifts of "Industry."

"That-Something," the real thing, was "Anygirl's" better self, and continually warned and advised her. He said in a prologue that opportunity is not something that comes and goes just once, but is constantly before "Anygirl" for her to make her choice. To succeed she must court "Industry" and the "Spirit-of-Service" and drop "Bluff" and "Selfishness" from her acquaintances and shun "Illusion" and "Luck."

Three scenes, two set in "Anygirl's" garden, and the other in "Industry's" office, show how any girl may acquire happiness and prosperity by going at industry with the spirit of service. She starts with luck and illusion and does not see industry, who is asleep. On the advice of poverty she awakes the industry in herself.

Although employed by industry in the second scene, any girl may naturally have bluff and selfishness. On good advice from "That-Something" of her inner self, she is persuaded to throw off these companions and seek the "Spirit-of-Service." When she threw back a curtain, a little girl, representing the spirit of service not fully grown, jumped through a large blue bell.

Arm-in-arm with the spirit of service and industry, she finds success and happiness in the last scene.

At the opening a chorus sang "Cottonfield Melodies." The singers were: Altos—Dora Adams, Lila Houston, Bessie Hyde, Beryl Joyce, Lena Knight, Myrtle Lowe, Willie Wilson. Sopranos—Mattie Casey, Willuce Downs, El Merito Horn, Helen Hunt, Luella Hamilton, Bessie James, Myra Nail, Glenn Scruggs.

Mr. Devereux was introduced by Percy Redmund, author of the play, and general superintendent of traffice in this division. Mr. Devereux gave a sketch of the growth of the long-distance telephone business. Mr. Van Meter spoke on co-operation and urged all members of the company to pull together for the common end—success.

Shirley P. English presided.

Brazilian Telephone Lines Merge Interests

Consul General Alfred L. M. Gottschalk, Rio de Janeiro, reports that by a decree published October 24, 1916, the president of the Republic of Brazil has permitted the Interurban Telephone Company of Brazil and the Companhia Rêde Telephonica Bragantina to join their lines along the frontiers of the states of São Paŭlo and Rio de Janeiro and the federal district of the republic at whatever points these junctions may be found necessary, and the companies may proceed to exploit the new system thus created under the provisions of article 99 of Law No. 3089 of January 8, 1916. This merging of interests will make possible something like general telephone communication through an exceedingly important and busy portion of the country.

It has been estimated, although there is some doubt as to the accuracy of the calculation, that there is in this portion of the country one telephone to each 100 inhabitants. The use of the telephone booth with a pay station has not gained much popularity, although a few have been established and bring in very profitable returns.

The system in São Paulo is in the hands of the Companhia Telephonica do Estado de São Paulo, which is a branch of the Canadian Rio de Janeiro Tramway, Light and Power Company of Rio de Janeiro, and the Companhia Rêde Telephonica Bragantina. The former of these companies was said some time ago to have 8,000 subscribers in São Paulo, Santos, and Campos alone. The Companhia Rêde Telephonica Bragantina, with headquarters in the city of São Paulo, serves nearly 5,000 subscribers and connects 171 cities and towns in the states of Minas Geraes and São Paulo. Some smaller local companies also operate.

Among Dr. Lee DeForest's latest apparatus is a one-quarter kw. oscillion or oscillating valve transmitter. As the wave generator the set employs a large audion bulb the filament of which requires 30 volts, while the high tension circuit calls for a current of 800 volts. The latter is supplied by means of a small motor-generator. A small fan is employed for the purpose of cooling the audion bulb. While the set is primarily intended for undamped wireless telegraphy, it may be used for wireless telephony by the addition of a microphone transmitter, one or two dry cells, and a telephone transformer.

Signing Too Big an Order

A Cancelled Contract with Two Slants

BY ELTON J. BUCKLEY

HERE is a case which gives a little different slant on the familiar case of the merchant who signs an order for goods without reading it, and afterwards finds that it calls for more goods than he thought he was ordering. The following letter comes to me from a Pennsylvania man, evidently a newcomer in his field:—

A salesman for a certain company called on me early last December and wanted to sell me an order. I had only started in business at the time and was rather green in regard to buying. The goods he was selling was a side line to the business which I am in, but I told him I would take a small order. So he made me up an order and handed it to me to sign, which I did without looking it over. But that night I looked the duplicate order over and found that it was much larger than I could use and also much larger than I could pay for as I had a very small business and no capital back of me.

So the following day I wrote the company asking them to cancel the order. They wrote me back stating that they could not cancel the order for the reason that they had already paid the salesman his commission on same. I then wrote them again, saying that if they would cut the order down to about $10 worth of goods I would take it, and if not I could not accept it.

The next I heard from them was a bill for the goods to the amount of $30, stating that they were then shipping the goods.

When the goods arrived at the freight station I had the freight agent return them to the company, and I also wrote the company, stating that I had returned the goods.

Some time later I received a letter from a collection agency, asking for payment, which I ignored, and still later I received two more letters from two different attorneys asking for payment.

About two weeks ago the company sued me for the bill. The railroad company tells me that the goods were delivered.

Now I cannot afford to pay for that amount of goods that would be in my store for years before sold.

Please let me know what can be done.

I have not the goods at present nor never did have them in my possession.

This correspondent doesn't say explicitly whether the salesman tricked him, as he sees it, into signing a larger order than he thought. If, for instance, it was understood that the order that was to be given was for $10, and the salesman made it out for $30, then one situation would arise.

If on the other hand the order as the salesman made it up was exactly what the correspondent intended it to be, but sometime afterward he got to thinking it over and decided he had overbought, then another and totally different situation would arise.

As both situations are interesting, consider the first one first. As I have pointed out before, there is an amazing amount of carelessness exhibited by business men of all grades in the matter of signing orders and contracts. Time and time again a paper which a buyer or a seller or a party to some contract signs, does not express what he wants it to. Occasionally this is due to fraud, but more often it is because it is not well drawn. But nevertheless, if the party who is deceived had a complete opportunity to read it over before he signed it, and neglected that opportunity, and by reason of such neglect was let in for something, he cannot complain but must take his medicine. The law has very little time for the "business" man who signs a paper without reading it, and finds himself deceived in consequence.

There is really only one exception to this rule. If a salesman obtaining an order, or the other party to a contract, pads the order or alters the contract, and then by some subterfuge prevents the deceived party from reading, it, the latter can escape on the ground of fraud. But there is no fraud in the eyes of the law when a salesman deliberately pads an order and openly hands it to the buyer to sign, believing that he will carelessly neglect to read it. That is a plain case of negligence on the part of the victim and what he got was coming to him.

So much for the first condition. Let me briefly discuss the second.

No buyer can deliberately and in full knowledge sign an order for merchandise, the order being upon some house that had never sold him goods before, and then back out of it afterwards merely because he changed his mind. An order is a contract which binds both parties unless one party (the seller) has by a long course of dealing, led the buyer to believe that he could cancel an order any time he liked.

In the case submitted to me there can hardly be but one ending to the suit. The minute this correspondent admits that he signed the order (if he was not tricked into doing it), judgment will be given against him for the claim itself, plus certain costs, to which must be added his attorney's fee.

This correspondent admits that he is green about buying. I will tell him how he can avoid such difficulties in the future, and this can also be read with profit by a great many buyers who are not green:—

1—Never order more goods than you *know*, after full consideration, that you want, for your signed order is a binding contract, and you may not be able to escape from it.

2—Never sign *any* paper, order, contract or what not, without first reading it slowly and carefully twice and asking for an explanation if any part of it needs explanation. And if something is lacking which you think should be in, never take the other man's word for that: "that's all right; we understand each other on that." Insist that it go in the paper and don't sign it till it does.

(Copyright, November, 1916, by Elton J. Buckley.)

Associated Press Uses Telephone Wires

The Associated Press leased wire service has been transferred from the Western Union to the American Telegraph and Telephone Company, commonly known as the Bell system. It is understood the night wire will soon be taken over by the Bell Company, and as soon as convenient all the Associated Press leased wire business will be done over the telephone wires. This means a great volume of business as the Associated Press is using over 25,000 miles of leased lines at present.

A remarkable thing about this change is the fact that the telegraph circuit is made up over the same wires that are being used daily for the long distance telephone business—both working at the same time without interference.

Automatics for Chicago Pier

Corporation Counsel Samuel A. Ettelson of Chicago and two of his assistants have approved as to form a contract which the harbor and subway commission proposes to let to the Automatic Electric Company for a fifty-line automatic exchange and connections to furnish telephone service at the municipal pier.

Transmutation Past and Present

Changing Independent Lead Into Bell Gold

BY TERRY W. ALLEN

IN ancient days, the old alchemists used to sit in caves and dungeons and work over huge retorts to find some liquid that mixed with the baser metals would transmute them into silver and gold. Their object was to find some element that would change the atoms of lead and iron into gold and silver.

It was thought that this discovery could be accomplished and that the finder of the secret would become immensely wealthy. This was one of the only problems that kept the alchemists from being persecuted because each of the princes and potentates under whose jurisdiction they were secretly hoped that his alchemist would discover the secret and untold wealth would fall into his coffers.

Today the dream of the alchemist is a shattered hope. No longer do the chemists of today worry their brains over finding the element that will transmute lead into gold. But transmutation is by no means a forgotten industry, and, although the philosopher's stone remains unfound, the means of applying transmutation in industry is a very great and growing problem.

If you want to find a means of transmuting lead into gold, all you have to do is to get hold of a worn out and broken down Independent telephone company, situated in some strategic place in the United States, where its upbuilding might give strength and vitality to other Independent telephone companies in that vicinity. All that you have to do is to take this plant and approach the Bell officials with the idea of a merger, and quicker than transmuting lead into gold this plant can be changed into golden coin; for the Bell Telephone Company seems bent upon getting hold of the Independent industry in the United States. It does not go into old caves and deep recesses of the mountains, but it does go into the halls of justice of the United States and carry to government officials these strange ideas about the undesirability of continuing worn-out telephone properties and beg the government for permission to merge these properties into the Universal System.

The laws of the country are no safeguard against the unfair competitive methods that the Bell Telephone Company has seen fit to employ during the past four years. The laws might as well be written on the sands of the sea as be in the statute books with a department of justice that fails to use these laws for the protection of the citizens of the country.

"Public convenience" and the ruling of local tribunals seem to have impressed the department of justice more strongly than any other construction of the laws upon the statute books. Why this has been so may remain a mystery, but a public enlightened upon this subject would demand specifically the reason why. This I am unfortunately unable to give, because I am unable to read the minds of the attorney general and his assistant. I believe, though, that the laws are plain upon this subject. I believe that a fair court interpretation of these laws would place Independent telephony upon a stable footing that would defy the elements that seem to be bent upon its destruction. The idea of transmutation seems to be greater than the idea of integrity or principle, about which the Independent operators seem to care little when their pocketbooks can be swelled by an alliance with the monopoly.

I wish to digress a little here from this idea of transmutation and speak just a word on the coming convention of the United States Independent Telephone Association to be held in Chicago in December. This convention will bring out many things. It will determine a policy to be pursued. The Independent operators have not been fairly represented in the nation by the Association. Too many conflicting views have bottled up any real service that the Association might have rendered. And the idea of transmutation of properties into the Bell system has weakened the Independent ranks to a great extent.

Whether or not the Association stands for this policy of the Bell telephone aggression, or whether it stands for the Independent telephone operators and manufacturers and a long lease on life for them remains to be seen. If the Independent convention at Chicago surrenders the principle of Independent integrity, and does not take a firm stand against the Bell monopoly, the general idea of the country will be that the monopolistic Bell tactics are right and that Independent telephony is an ambiguous industry, whose end is to be disastrous to those who attempt to foster it.

There is another question that comes to my mind right at this time on this question of transmutation. For some time past the Western Electric Company has stated its position as not desiring any more Independent telephone business. Just what this means or entails I cannot venture to predict, but I have my own ideas on the subject. One of those ideas I will propound, and that is this: that if the Western Electric Company is getting more work than it can do, and if the Bell telephone companies cannot be supplied with material fast enough to take care of their growth, a larger and more comprehensive organization along this line will become an absolute necessity.

Now, if the government allows amalgamation of telephone operating companies, what is to prevent the government from allowing amalgamation of telephone manufacturing properties? There is no real reason to believe that the Bell interests will stop at a monopoly of the telephone operating field. If they can accomplish their end with the aid and assistance of a complaisant department of justice, is it not a fact that they will next turn their attention to the manufacturing field? Is it not reasonable to suppose that they will make a proposition to one of the largest and most influential Independent telephone manufacturing concerns in the country and sublet a number of contracts to that manufacturing concern for the building of apparatus for the American Telephone and Telegraph Company and its subsidiary operating companies? There is no question in my mind that this will be the next move if this transmutation of Independent operating companies into the Bell company continues. For it is

only another step. Wipe out the Independent telephone operating companies and only the Independent telephone manufacturing companies remain to be washed from the slate. Consequently, I think that there is a grave danger here, that seems to be overlooked by the Independent telephone field; the danger that the manufacturing interests may also be attacked with impunity if the merger program of the American Telephone and Telegraph Company is continued. I only point this out as a danger. So far as I know there has been no move on the part of the Bell Telephone Company toward purchasing any of the Independent manufacturing plants, but it is a clearly defined fact that the Western Electric Company cannot manufacture all of the goods and all of the material and all of the telephones necessary to supply the American Telephone and Telegraph Company and also take care of its European and Independent trade.

Consequently, when this condition becomes pressing, it is only natural that the telephone monopoly should look to one of the strongest Independent telephone manufacturing plants, to transmute into itself at a single blow one of the most influential Independent manufacturing concerns. Which concern it is that may be approached on this subject I have not the slightest idea, nor do I like to predict such a thing, but surely there is a possibility there of a great danger threatening the Independent telephone ranks.

Suppose the Bell Telephone Company, through the Western Electric Company, should make such a proposal to one of our Independent telephone manufacturing plants. What could stop such a move if the Independent telephone industry looked upon it as it does upon recent mergers? I cannot see anything that could prevent a consummation of this kind of an attack. If the department of justice holds the same views toward a consolidation of the manufacturing interests as it does toward the consolidation of operating interests all would be lost.

All that an Independent telephone manufacturing plant would have to do would be to say that it was in a financially bad condition, and the government officials would state that there was really no competition where there was no financial strength, and that they would not interfere or block such a merger, as the public would be greatly benefited by such a scheme.

There can be no question that the Independent telephone industry has suffered immeasurably through the department of justice's attitude; but this cannot go on long. There is a danger that Congress will pass the president's suggestion to allow the combination of corporations for carrying on foreign trade. If this is done, the Western Electric Company could clearly combine with the Independent telephone manufacturers in the furnishing of telephone apparatus for European and foreign trade. The Independent telephone industry is seriously beset by a number of complicated problems, of which transmutation is not the least. What the result will be depends upon the action of the government authorities who have these matters in charge. Our laws are plain today, but they have not been used in the interest of Independent telephony.

Will we wake up in time to see the grave danger that besets us, and will the Independent telephone convention that is to meet in Chicago realize this danger, and come out openly and honestly for the industry that it represents?

A. A. E. Gains Members

Nine members of the American Association of Engineers conducted a meeting at the Y. M. C. A. building, Gary, Indiana, which was attended by 37 engineers not identified with the movement and three members at present employed in that city.

The objects, methods and results secured by the association during its 16 months of existence were explained by Past President W. D. Wilcox, Director W. J. Mauer, Counsel R. H. Holmes, Members W. R. Shelmire, Carl Hellenthal, A. F. Beck and F. A. Coy and National Secretary Arthur Kneisel. The result of this aggressive effort on the part of this live organization resulted in the securing of 21 applications for membership that night and the formation of the temporary organization of the Gary Chapter of the American Association of Engineers. Up to November 1 the association had secured 31 members from Gary.

Gerard C. Dooge, squad boss of the structural engineers department of the American Bridge Company, was elected temporary chairman and W. H. Sallwasser, instructor in the American Bridge Company school, was elected temporary secretary and treasurer.

This is the first instance of the association succeeding in organizing a chapter during one evening's effort and is a healthy indication of the interest which has been aroused by this business organization of the engineer. The total membership of the A. A. E. is 1,335. When its membership reaches 1,500 the initiation fee will be increased to $4 and according to the present rate of growth this will probably occur before January 1, 1917.

Wisconsin Convention in February

The Wisconsin State Telephone Association will hold its convention on February 6, 7 and 8, 1917, having entered into an agreement with the various telephone associations throughout the country and made these dates conform so that exhibitors could attend at least possible expense.

Rooms are already being engaged at the Park Hotel at Madison, Wisconsin, for these dates.

This convention should be the banner convention of the association. It is following the example of the parent organization at its Chicago convention, in that it is going to give the entire morning to the manufacturers and in turn expects them to help with the business sessions, which will take place in the afternoon.

Those who expect to attend should notify the secretary in writing as early as possible. Address Walter J. Gallon, Sheboygan, Wis.

Telephone Growth in Sweden

Although the last riksdag at Stockholm, Sweden, increased from four to nearly seven million crowns the usual appropriation for new telephone lines, the traffic has again caught up with and overtaken the existing facilities, and the officials in charge of telephones and telegraphs are working out a plan calling for the installation of a great number of new trunk lines in the coming year. The percentage of yearly increase of demands on the lines is steadily growing greater.

It was 5.9 per cent in 1912-1913, rose to 7.3 the following year, to 7.5 in 1914-1915, and exceeded the last named figure in 1915-1916. Users of the long distance lines, particularly between Stockholm and Malmo, complain that they frequently have to wait two hours for a clear wire.

Continuous Inventories and Their Value

Paper Read Before the American Institute of Electrical Engineers

BY HARRY E. CARVER

Due to enactment of laws in various states requiring approval of State Commissions before issue of securities, and due to other conditions, there has arisen a demand for a continuous inventory of property owned by utility companies.

First section of this paper discusses the advisability of attempting such an inventory, giving possible uses and advantages to be derived therefrom, and the second section discusses the preparation of such an inventory, suggests the division of the property into four general groups for the purpose, and outlines general forms and methods for collecting and recording data required.

AMONG papers presented at the Pacific Coast Convention of the Institute at San Francisco in 1915, under the general heading of a *Symposium of Inventories and Appraisals of Properties,* was one by Mr. W. G. Vincent, Jr., in which the subject of keeping inventories and appraisals up to date was treated in some detail. In the discussion which ensued, it seemed to be the opinion that the amount of detail and extra work and expense which would be incurred by a company's operating force, would be too great to make it advisable or practicable to do this. At least one of the large public utility companies under the jurisdiction of the New Jersey Commission, namely one of the telephone companies connected with the Bell system, is apparently accomplishing this with an expenditure of labor and other expense which is apparently within reason, and both the New Jersey and New York Commissions are endeavoring to develop methods for keeping inventories up to date in which it is hoped that the cooperation and approval of public utility companies in general may be secured.

DISCUSSION OF THE VALUE AND USE OF A CONTINUOUS INVENTORY

The desirability and the purposes for which an inventory and appraisal of a company's property is made have been generally discussed heretofore and the necessity of making such an inventory and appraisal under certain conditions is probably sufficient apparent to eliminate the necessity of further discussion on this matter. Such inventory and appraisal of any large company is comparable to a general census which it has been customary to make at periodical intervals for centuries. If it were necessary or advisable to have the results of an up-to-date census available at frequent intervals the question would doubtless arise as to the desirability of keeping a complete census of all the people in the country up to date by other means than going out and counting them every five or ten years.

In the same way, if it is advisable or necessary to have available a total inventory and appraisal of a company's property at frequent intervals of time, it would seem advisable to consider the problems involved in maintaining such an inventory at all times.

If this kind of an inventory would serve no other purpose than in making data readily available for the compilation at any time of a total inventory and appraisal of the company's property, then the feasibility of doing so depends upon at least four factors.

1. The frequency with which it may be desirable.
2. The additional yearly expenditure required, multiplied by the number of years intervening compared with the cost of obtaining the results by a complete new inventory at a later period.
3. The comparative accuracy of an inventory by the two methods and the accuracy which is liable to be required in future appraisals of public utilities.
4. The speed with which it may be desirable to compile the same.

A consideration of the frequency with which complete inventories are likely to be required leads to the conclusion that they are likely to occur much oftener in the future than in the past, as the custom of requiring yearly reports to various tax commissions and government regulating commissions appears to be becoming much more general and required in more detail than heretofore.

A consideration of the other factors involved in keeping a continuous inventory brings to light a number of other reasons and advantages to be obtained by carrying out such an undertaking. Besides the company itself, considered as a unit, there are at least three other classes of people who are interested in the operation of a public utility corporation.

1. The patrons or customers of the company.
2. The investors in the company's securities.
3. The general public, including the various governmental agencies representing this public.

A perpetual inventory of a company's property would be useful to any company in the following ways:

1. Data are made available for answering any complaints as to discrimination or overcharges in existing rates and the company should be able to present promptly a full statement of facts on the basis of which a satisfactory determination can be made.

2. The increased cost of labor and material renders it probable that many rate cases in the future will involve increases, rather than decreases, in rates for services rendered and the company will need to be fortified with all necessary facts as to the cost of service rendered, among which are included as two of the principle items, a fair return on the investment and a yearly allowance toward a reserve fund for replacing the property involved, at the time that such replacement is needed.

3. In many rate cases and cases pertaining to security issues, inventories and appraisals have been made and depreciation and present value estimated. Various methods have been used for making these determinations and estimates of future depreciation have been made. There the matter, in most cases, has been dropped and the future depreciation has been left to take care of itself.

The cut and dried formulas for determining depreciation used in many cases have often been challenged and criticized. The criticism has been so severe that it is not at all unlikely that new methods will be adopted in the future which will depend upon changes which actually take place as time goes on and that will have to be checked up from time to time. Probably the surest check upon accruing depreciation or an accruing renewal fund is a comparison of the fund with the total cost of the

property, subject to depreciation, which, of course, can only be made by having at hand an up to date inventory. It is quite probable that, in the future, one of the most urgent reasons for making an inventory and keeping it up to date will be the necessity of having some means for judging whether or not a company is making reasonable preparation for renewing and perpetuating its property.

4. For most public utility companies, the approval of a state commission is necessary for the issue of new securities. The labor and time involved in securing the approval of the same, both on the part of the company and of the commission, would be materially reduced. There would be less interruption of the work performed by the operating force of the company from governmental inspectors, either in checking up construction expenditures for new securities or in making a complete appraisal of a company's property for this or other purposes.

5. The market for a company's securities would, doubtless, be increased by a general knowledge that a running inventory of all the company's property was maintained and consequently that some check was available upon the total property represented by securities issued on the accounting methods followed by the company.

6. It would probably make available data for securing franchise extensions from various municipalities under more equitable terms than appears to be possible at present.

7. Data would be available for making investigations to satisfy the demands of labor employed in the company's operations as to whether they were, or were not, receiving a fair proportion of the company's revenue. One of the reasons privately advanced by labor union men for demanding an increased share in a company's revenue is that the books of many companies are kept in such a manner that the revenues are covered up in some way and their total income is not shown in the reports made to the stockholders or public bodies. Without commenting on the merits of this contention, it is probable that the means of proving or refuting it would be much more readily available than at the present time.

8. It is the general experience in checking up the books of various companies in New Jersey for approval of construction expenditures that comparatively little question can be raised as to the total amounts claimed, but that the distribution to the various items or accounts by which the expenditures are classified, are very frequently incorrect, which fact is generally brought out by making an inventory of the property acquired and checking up the unit prices. Hence there seems little doubt that a continuous inventory maintained by a company would be conducive to much more accurate accounting and distribution of charges between fixed capital and operating expenses as well as a more accurate distribution of general overhead charges than is possible at present.

9. Insurance adjustment for fire and other losses could be more readily and equitably obtained.

10. Tax commission reports and yearly reports to regulating bodies could be more readily compiled.

11. At the present time a few large companies are keeping a more or less detailed record as to the location of their various items of property, especially of underground conduits, etc. Many companies, however, have very incomplete records as to just what they own or where it is located and information is not readily available as to what service they are able to render at a given location, either permanently or temporarily. As an illustration of this point, the case may be cited of a company which was recently called upon for service by a prospective customer in an outlying district. An employe of the company, to whom the request was made, replied that the company would be unable to make the connection to the customer's premises, as the company's lines were too far away. Later investigation proved that the company had a service connection to the house next door and that the line extended to within about fifty feet of the prospective customer's lot. A continuous inventory would necessitate the keeping of records which would prevent these or similar occurrences.

12. In addition to requiring records which would give the location of property owned, the adoption of such a system in connection with a continuous inventory and appraisal would be of great value in promoting more efficient construction and operation, as detailed costs would readily be available from which the costs of rendering any particular service or of making any particular extension or betterment could be accurately determined.

Some of the advantages cited above would apply equally well to the company's customers, investors, and the public, but the above seem to be sufficient.

PREPARATION OF THE INVENTORY

This subject apparently implies first a complete inventory and appraisal of the property as of a given date but this is not a necessary prelude to the above, and, as most companies have not a complete inventory and appraisal of their property, it seems advisable to state that a company can readily start an inventory of all new property acquired from the present time forward and all old property withdrawn from service and either replaced or abandoned, without detailing a special force of engineers to make a complete inventory of all property. The record of the company's property in existence at the time the inventory is started can be obtained at such times as the company's engineers and accountants may be available for this work, and, in the course of a few years it might be possible in this manner to obtain a complete inventory.

The actual problem of maintaining a continuous inventory resolves itself into the question as to how small the units may be into which a property may be divided and records kept without an unreasonable expense, and how large the units of property may be taken without making identification of any item or part of the property so uncertain as to destroy the accuracy of the inventory and subsequent changes in the capital account.

To illustrate, suppose a company builds today a large station and ten years from now it builds an addition, removing one wall and making use of some of the material for the new work. Or, a company builds an overhead distribution system; five years later it becomes necessary to replace some of the existing wires on a certain street with a larger size; ten years later it is necessary to move a part of this same line to the other side of the street and install joint poles with another company, and fifteen years later it becomes necessary to replace all this construction with an underground system.

Is it possible to keep an accurate record of these transactions so that the capital account shall record the cost of the additions and the proper withdrawals in going through these various changes without relying on estimates of both quantities and costs to such an extent as to render the records questionable as to their accuracy? Heretofore it has been necessary to rely largely on estimates of the original cost of both labor and material in recording such transactions; but, with proper co-ordination and co-operation of the various departments concerned, we believe that the necessity of making estimates can largely be obviated, and the total cost installed in place at any particular period of time obtained without any great expense.

The fundamental requirement for accomplishing the above is an efficient "word order" system, also quite generally known under the head of "Authorizations for Expenditure" or some similar name. A work order system is in force in practically every company of appreciable size today, and with more or less modification can be adapted to give the records required.

In order to obtain the necessary records for writing off the original cost of the property when it is retired, it is absolutely necessary that one additional step be added to this system as it is generally in force in most companies: viz, *an allocation of the cost of each piece of construction or property acquired must be made in detail when the work is completed, and preferably just before the work order is finally closed,* as such an analysis will frequently disclose inaccuracies in either debits or credits. This practice is followed by many companies to a certain extent at the present time, but must be applied to all work orders, and the final cost must be reduced to the same units that are liable to be needed in making estimates for withdrawals or additions. Unless the property acquired is going to last forever or be withdrawn from capital account as a unit, such an estimate must be made sometime, and there would seem to be no time when a more accurate analysis could be made than at the time the work is done or property acquired.

An analysis of costs made at this time would aid in checking up inaccurate distribution of labor and material, and it is very important to do this, as the fact must be recognized that all of these records are going to depend primarily for their accuracy on the proper distribution of labor and material by the construction foreman, and especial emphasis must be laid on this point.

Many companies are keeping at the present time an additional set of records which can be made to fit in nicely with a continuous or perpetual inventory. These records consist mostly of cards showing the location, type, size, and dates of installation, change in location, etc., of meters, transformers, poles and attachments, and possibly, in some cases, street lamps, services and similar items. As stated in the first section of this paper, such records are valuable for other than strictly inventory purposes but they are also essential for this purpose in connection with the forms suggested below.

The items of property for the purposes of inventory may be divided into four general groups as follows:

A. Those items which are large enough to be recorded individually or in small groups with one entry, but which are liable to be altered or changed in part, *e. g.,* buildings.

B. Items which may be recorded individually and which are withdrawn from service as a unit; *e. g.,* subscribers' instruments, meters, etc.

C. Items which must be recorded in units of length, pounds, or some similar units and miscellaneous items; *e. g.,* wires and cables, insulators, arresters, etc.

D. Those items of property which are usually carried in inventories at the present time and which are usually checked up by field inventory at regular intervals; *e. g.,* materials and supplies portable tools, office furniture, etc.

There may be considerable difference of opinion as to just what method should be followed in collecting the data required, but a general scheme could be followed for either a gas, electric railway or railroad, telephone or telegraph, water or sewer utility or a private industrial plant by classifying the property in the general groups indicated above about as follows:

A. 1. Land and right of way.
2. Building and structures.
3. Equipment of stations, buildings, etc.

B. Poles, transformers, meters and services for an electric company; meters, services, fire hydrants, lamps, etc. for a water or gas company and similar items for these or other companies.

C. Wires, cables, conduits, crossarms, insulators, for a telephone or electric company; feeder cable, trolley wire, straight track, etc., for railways; transmission and distribution mains for water, gas and sewer companies.

D. Office equipment, shop equipment, stable equipment, etc.

FORMS FOR GROUP A.

The general form of recording data for items in group A in detail is given on Form 1.

These data should be obtained from the completion report of the work order, an extra copy of which it might be advisable to file with other inventory data.

The basis for estimating the unit prices for the cost of brick wall removed (mentioned on Form 1) should be found in this completion report. A list of quantities involved should be available from the information and plans in the hands of the engineer responsible for the new addition. With this information there should be need for very little estimating which is not based on actual facts.

The summary of all such property classified under any particular account for any particular division or subdivision could be recorded on Form 2 and the totals for that account or division readily obtained by summing up the items, on such occasions as a total is desired, probably no oftener than once each year.

FORM 1

HOME TELEPHONE CO—*Subsidiary Co.....*
DIVISION—Northern LOCATION—14th St., Belleville File No. 5
Computer.....Checker.....App'd by....Date..Acct. No. 118
SUBJECT Exchange Buildings.....Reference.....Sheet No. 1
(or other similar items in Group A)

Auth. No. and page	Date acquired	Description—As originally acquired or of addition or withdrawal	Area — Size or No. of units	Original cost		Total cost corrected to date for additions, etc.	Est. remaining life
				Per unit	Total		
543-10	1911	1 Exchange Building, brick on concrete fndn., slate roof, etc. 40'x30' one story and basement	1200 sq. ft. 20000 cu. ft.	$2.00 .12	$2,400	$2,400	50
1585-4	1916	Brick wall removed 30'x18' high			200	2,200	45
1586-4	1916	Addition 10'x40'	400 sq. ft. 6667 cu. ft.	2.50 .15	1,000	3,200	46.6

EXPLANATORY NOTES ON USE OF FORM NO. 1

Note 1—If any item of property subject to depreciation is acquired subsequent to date of first use, this fact should be indicated together with other information available as to original construction, date, cost, etc.

Note 2—Remaining life of 45 years is obtained by subtracting 5 years elapsed between 1911 and 1916 from 50 year life first estimated.

Remaining life of 46.6 years is obtained by computing a weighted average of $2,200 at 45 years and $1,000 at 50 years.

Note 3—Present value on a basis of straight line depreciation may be readily obtained by multiplying $3,200 by ratio of 46.6 years to 50 years, giving 93.2% and $2,982.

FORM 2

HOME TELEPHONE CO.—*Subsidiary Co.....*
DIVISION Northern LOCATION All File No. 5
Computer.....Checker.....App'd by.....Date.....Acct. No. 118
SUBJECT Summary of Exchange Buildings, 1916 Sheet No. 101
(or similar item in Group A)

Ref. Sht.	Item	Location	Date originally acquired	Cost to Jan. 1	Added	Withdrawn	Cost Dec. 31	Present Value Dec. 31	
								%	Amt.
1	Ex. Building	14th St. Belleville	1911	$2400	$1000	$200	$3200	93.2	$2982
2	ditto	First St. Nutley	1906	etc.					

Transferred to sheet No. 1-10

FORM 3

HOME TELEPHONE CO.—*Subsidiary Co*.....

DIVISION Northern LOCATION All *File No.* 5
Computer.....*Checker*.....*App'd by* *Date*.....*Acc. No.* 124
SUBJECT Cedar Poles Type X Reference.....*Sheet No.* 1
(or similar items in Groups B or C)

Date	Ref. sheet	Number of units				Cost per unit*	Total cost†	Corrected total cost to date	Years	
		Added	Withdrawn No.	Withdrawn Date orig. installed	Net total to date				Av. life units withdrawn	Av. age in units installed

*Average costs for all units of this size for any given period—say one year.

†Prices might be averaged and one figure shown, or if not much variation in price, they might be withdrawn at the average cost of the 250 shown at the beginning of the year.

FORM 4

HOME TELEPHONE CO.—*Subsidiary Co*.....

DIVISION Northern LOCATION All *File No.* 5
Computer.....*Checker*.....*App'd by*....*Date*.....*Acct. No.* 124
SUBJECT *Summary of Poles—1916* *Sheet No.* 101
(or similar item in Group B or C)

Ref. sheet	Sim	Type	Number of units				Cost of units				Av. cost per unit Dec. 31	Present value Dec. 31	
			Jan. 1st	Added	Withdrawn	Dec. 31	Jan. 1st	Added	Withdrawn	Dec. 31		%	Amt.

Note—"%" under "Present Value" for striaght line depreciation would usually be obtained by comparing average age of units installed with average life of units withdrawn. In some cases it might be desirable to consider salvage in arriving at present value.

FORMS FOR GROUPS B AND C.

The same forms are recommended for both groups B and C, but the method of collecting the data required is different.

For both groups it is thought best to use unit costs averaged for the district into which the company chooses to subdivide its territory, say a tax district, and for a certain period of time, monthly, quarterly, or yearly. The average for labor, storeroom charges, miscellaneous material items, overhead charges, etc., would necessarily need to be computed after the close of the current period or the average taken from the preceding period and final adjustments made for variation.

The total quantities for all items in group B, for which a card record is assumed to be made, can be computed either from the cards or from the completion reports of the work orders. Probably the total could be obtained more readily from the card records, whether tabulated by hand or sorted and tabulated mechanically by means of the Hollerith system of card records.

For all items in group C, the totals of both quantities and prices would probably best be obtained and reconciled with the amounts given in the completion reports of all work orders involved, although they might be obtained from field books or street maps showing construction changes for the required period, or from pole record and manhole record cards which usually indicate the wires, cables, conduit, etc., extending to the adjacent units.

Form 3 shows method of recording a group of similar units, and Form 4 shows method of summarizing units of various sizes.

FORMS FOR GROUP D.

Form 5 is recommended for summarizing items in this group as it is contemplated to include only such items as a company carries or could reasonably carry on an inventory which is usually made at the present time by actual count. This inventory as applied to office furniture, large portable tools, etc., usually gives the estimated present value of these items and they are carried into the property account each year at this depreciated value.

The first entry for each of these items is naturally the cost new and it is recommended that this cost new be carried in the inventory in a parallel column with the depreciated value until such time as the item is retired.

FORM 5

HOME TELEPHONE CO.—Subsidiary Co.....

DIVISION Northern Location Belleville Office *File No.* 5
Computer....*Checker*....*App'd by*....*Date*.....*Acct. No.* 107
SUBJECT General Equipment, Dec. 31, 1916 Ref.....*Sheet No.* 101
(or similar items in Group D)

Quantity	Unit	Item	Year acquired	Original Cost Ref.	Original Cost Unit	Original Cost Amount	Present value %	Present value Amount
2		Typewriters	1914	52	$79	$158	75	$118
2		Typewriter desks.....	1912	35	20	40	80	32
6		Bent wood chairs.....	1916	Bill	3	18	100	18
		Totals, Dec. 31.....				$216	77.7	$168
		Additions 1916				18		
		Total of items Jan. 1..				$198		
		Totals per inventory, 12-31-15		61		210		
		Withdrawals 1916				$ 12		

Transferred to sheet No. 1-10

FORM 6

HOME TELEPHONE CO.—Subsidiary Co.....

DIVISION Northern LOCATION.....*File No.* 5
Computer....*Checker*....*App'd by*....*Date*.....*Acct. No.* 1
SUBJECT Grand Summary, 1916 *Sheet No.* 10

Account No.	Ref. sheet	Item	Total Cost Jan. 1	Added	Withdrawn	Dec. 31	Present Value %	Amount
101	5	Land, etc.	.....	.....	....	.....	.....	.....
107	101	General equipment.....	$ 210	$ 18	$ 12	$ 216	77.7	$ 168
118	101	Exchange Bldgs.....	2,400	1,000	200	3,200	93.2	2,982
124	101	Equipment (Form 4)....	15,000	2,440	322	17,618	74.6	13,143
		Totals Nor. Div. 1916.	$18,110	$3,458	$534	$21,034	77.5	$16,293

Explanatory Notes in Reference to Use of Above Forms.

Note 1. Loose leaf sheet 8½"x11" is recommended for all forms.

Note 2. For all withdrawals use red ink.

Note 3. Forms 1 and 3 constitute the continuous record. All other forms are made up when it is desired to arrive at totals and are correct for one date only. If periods used are different than calendar year, forms should be slightly modified.

Note 4. Provision for identifying computers, etc., on Forms 1 and 3 after first entries could be made by having initials inserted in date column or by providing separate column.

Note 5. Figures carried to grand summary, Form 6, are merely illustrative and not the totals which would be obtained if more entries were made on Forms 2, 4 and 5.

Note 6. From totals on Form 6, the amount of additions for which new securities may be issued may be readily determined.

Note 7. By comparing Form 6 as filled out for 1915 with year 1916 the credit which must be made to reserve account from earnings to provide for the year's depreciation may be determined.

Also, that the total cost new of all items be carried in the property account; and that the estimated accrued depreciation of all such items should be carried in the depreciation reserve account instead of being charged directly to operation each year and lost sight of thereafter as is the practice with many companies today.

A comparison of such an inventory at the end of any year with the preceding will indicate the total value of all withdrawals and additions and a proper adjustment can then be made in one lump sum between the capital account and the depreciation reserve.

Form 6 is to be used as a summary of all property and probably needs no explanation in addition to notes.

To carry out the above, it would seem advisable to create a separate department under the joint supervision of the chief engineer, general auditor or controller, and the official in charge of the Public Relations Committee of a utility if such a committee exists. The man in charge of this department should understand both engineering, accounting and statistical work, and be capable of cooperating with all other departments of the company to secure the full benefits possible to be derived as outlined in the first section of this paper.

The methods indicated above would necessarily need to be modified to suit any individual company.

European Telephone Development

Translations from the Foreign Press and Communications from European Engineers

BY FRED W. SCHOLZ

THE activities of telephone operators are composed of a large number of detail operations. When answering a call and making a connection, the operator first inserts the answering plug in the subscriber's jack, throws over the listening key, asks for the required number, tests for busy or idle wire, puts the calling plug in the proper jack, and rings the subscriber's telephone. At the same time that she has to watch over this call, she has to take care of other new calls; at the end of the call she removes the plugs with the cords from the jacks and returns the keys to the rest position. If the call is one that requires registering, the operator has to press down the registration push button key, or has to fill out a slip with the long distance or special call. Again the action differs, when the connection is to be made over an outgoing line, or, coming in, is to be handed over to a B-operator.

The variety of all these manual operations, and the fact that many of them fall simultaneously, make it impossible to watch over any one act of the operator for the purpose of studying the efficiency, as for example, the time taken to insert a plug into a jack, and thus make what is known as a time study. It is better to take a whole series of actions, which make up a unit as a basis of comparison. In this relation it has been found advisable to use the work required to answer an ordinary call as a unit of measurement. The simplest case of a call is a connection, which is made by the operator in a multiple field at her own switchboard, and if the call is made by a subscriber who pays by the year so that no special registration action need be taken by the operator. According to this unit all the other activities of the operator can then be recorded and judged.

The conditions under which a unit of operation is completed, are also to be watched a little closer. Evidently it makes a big difference whether the operator can reach entirely over the multiple panel field in which the call is to be made, or whether she can reach only a section of it, and whether she will have to rise from her seat to reach the part of the field in which the required call jack lies. In this latter case the work required to make the call would be greater. An experienced operator moreover will be able to make the connection more quickly than a less experienced one. Where a subscriber does not answer as quickly as he ought to, the work of the operator is retarded. The efficiency is therefore dependent on various factors, mainly on the following ones:

1. *Technical Equipment:* The operator works at a multiple switchboard with no more than 10,000 lines. The multiple field is distributed over three switchboard positions and so arranged that most of it can be reached from a sitting position. The operator need take care of one position only. For the connection, pairs of cords with double lamp clearing signals are used. Special devices for better distribution of calls are not at hand.

2. It is assumed that the operators are of average intelligence and have been carefully trained in the telephone school department. Of course specially gifted operators can obtain better results than only average ones. It is of importance that the neighboring positions give proper cooperation to operators and that operators help each other out to the fullest extent. The activity of the regular operators should also be aided by the supervisors; in addition the operators should be relieved of all such work as answering information calls or giving the time, etc.

If now all other kinds of calls and connections that occur in switchboard service are compared with the unit call, then there can be found for each type of call a valuation factor which is either greater or smaller than 1, accordingly as the taking care of the calls requires more or less work than the care of the standard call. For explanation a few of the calls met with in operation are discussed.

A call coming from a subscriber paying a flat rate, which is taken care of by an operator in her own multiple field, and is recorded at the end of the call by merely pressing down a push button, is valued at 1.05. If the call is connected by use of a trunk wire over an outgoing trunk to another exchange, the factor is 1.5; if there is added to this the work of recording the call by having the A-operator press down a push button key, the factor becomes 1.55. If in place of the trunking system there is used the regular call signal system, the factor is 2, and with additional registration of calls 2.05. At the B-operators' positions the work of making connections is much more simplified, consequently the factor here is less than 1. Where at the B-places a full automatic call system is used, and no party lines lie in the multiple field, the factor is 0.4, where we presuppose that the multiple field is repeated every second operator's place, and that the A-operators work with a group of 3 B-operators. As soon as there are party lines or call push buttons have to be pressed down, or less than 3 operators belong to the same group, the work of the operator is increased, consequently the valuation factor rises. In the same manner all other types of calls and connections must be valued, considering all technicals aids and helps that can be found in the switchboard and exchange equipment.

Standard of Measurement: If we use the units just discussed as standards, an operator can make as high as 230 calls an hour. This efficiency is figured for the average operator and so estimated that this limit can be maintained during the ordinary periods of traffic without any trouble, and on the other hand can be increased in times of peak traffic loads by 20 per cent. A further increase is possible only on very busy days around Christmas time and then means an overworking of the operators.

From this figure 230 we can deduce that for the unit of measurement $\frac{3600}{230} = 15\frac{2}{3}$ seconds of the entire working time of an operator are actually employed in making the call. In reality the time taken by an operator to answer a call taken as a unit of measurement is considerably shorter, so that the operator when making the required 230 calls works with quite a few

pauses between. These pauses are necessary on the one hand, in order to prevent an overworking of the operator, but are given automatically from the irregularity with which calls come into the exchange. A certain balance can be obtained, if the neighboring positions give help; but even then there will be greater irregularities. Lately, attempts have been made to reduce these irregularities by installing second and third auxiliary call lamps, and by automatic distribution of calls to free operators. In this case the working conditions for the operators become more favorable and the efficiency per hour increases in proportion. For example, if the call lamps are repeated once, so that six operators could be counted on to answer a call, then the factor of valuation for a call drops down to 0.94 and the capacity per hour increases to $\frac{230}{0.94} = 244$.

The various valuation factors can be collected for practical use in a simple way. For example, we wish to find out how to valuate calls, which come in from a contract subscriber with push button registration system, 40 per cent of which are connected by trunking service and 20 per cent with direct call connection to other exchanges.

For the ordinary call with push button counter, the value is.....1.05

For the further use of a trunk wire an addition of 0.5 must be allowed for each call, i. e., for 40 per cent $\frac{0.5 \times 40}{100} =$.....0.20

For further work with call system (1.0 per call) we have $\frac{1.0 \times 20}{100} =$.....0.20

A total of.....1.45

An operator could therefore be expected as normal work to make $\frac{230}{1.45} = 159$ calls per hour without excessive fatigue.

Efficiency of the Individual Operators: If tests are to be made to find out how the individual operators work, careful registration of calls must be made at the individual places.

As aids for recording and counting, electrical or mechanically operated counters may be used and in addition slip counting may also be employed. The use of electrical counting system is naturally the most advantageous. The counters are devised on the principle of the ordinary subscriber-call counters and are operated by means of push buttons. Each operator has a counter push button, found usually on the left side right behind the trunk wire buttons. The counters for all operators are usually collected at one place, commonly the manager's desk, in order to facilitate the hourly reading and recording of results. For supervision of the counting of operators' work, a branch of the supervisory line is connected into the instrument of the operator so that the supervisor can listen in on any conversation. The supervisor in that way can test any one operator, without the latter's being aware of it, and his counting must agree with the reports made by the registering device of the automatic counter at the operator's place. All that is necessary, however, is to extend these inspection tests over fifty calls.

The mechanically operated counters are usually operated by hand pressure, which counters, fastened at the side of the switchboard can be pressed down easily. The reading of these counters is rather difficult, as the supervisor has to go from place to place to get the results. Much more difficult is the counting by slips where the operator has to mark for every call answered on some sort of a regular call slip. As a rule this system is used only to record special calls, which do not occur very often, and where some special record is required.

Regulation for Counting: In order to obtain a proper picture of the work of the operator, it is not sufficient to register all calls actually completed, but also busy calls must be counted. The general rules may be summarized as follows:

1. The operator counts the calls handled by her with the counters of her own position, even when the call signal lies at a neighboring position.

2. Every answering of a call signal and receiving of a desired number from a subscriber is to be counted as a call, regardless whether the call is connected or not. If the desired line is found to be busy and if the subscriber immediately asks for another number, this is counted as one call. The same is true, when the operator finds the line first tested busy and has to test out other jacks of the same subscriber or other jacks for outgoing trunks.

3. Every answering of a cord signal (flickering of the subscriber's lamp) and making of a new connection or attempt to make a new connection is counted as another call. If the calling subscriber gives the flicker signal and asks for another attempt to reach the previously called subscriber, this is not called a new call.

4. If the operator makes a connection, which first could not be made, subsequently, after she has first called the subscriber herself, then this is counted as a new call. The unsuccessful attempt to make such a connection is not to be counted as a call.

5. The call is to be counted, while the operator takes the number asked for by a subscriber; at the B-positions counting can be done after completing the call.

Time for Recording: In general counting should be done by the month. The traffic figures usually change so much by seasons and by various months, that statistics in greater intervals of time than a month give no valid picture. In addition the change in the numbers of subscribers and moving of subscribers always gives changes which make a counting for more than a monthly period inadvisable. As the traffic within the various days of the week varies, it is not good practice to take each day separately; it is better practice to make counting over two days in succession and then strike an average. If successive days are not taken, the days should be selected, so that they represent normal days of traffic. In all places where business houses close half a day on Saturday, this day should be omitted. The same is true for days just before and just after holidays, as also for Sundays and holidays. On the statistical days the number of calls is registered every hour; at the same time the working hours of the operators needed to answer the calls are counted. By watching the efficiency per operator per hour, a viewpoint is reached, as to how traffic runs from hour to hour and how many operators were kept busy during those hours. Also statistics should be kept of the number of supervisory hours and the auxiliary hours of service given by operators during lunch hours and breakfast hours. If a curve is drawn for the calls per operator it is easily seen whether the calls are evenly distributed over the various operators. Greater variations should be balanced by the aid of the intermediate distributing board.

As was mentioned before it is also important to note how calls come in from the standpoint of the number of

calls at A-operators' places, how many calls come in within the multiple field of the operator, how many require trunk wires, etc. These statistics can be united with the monthly calls, but need only be recorded every three months, as they do not vary so much. The quarterly special records are best taken two weeks before the monthly counting and can also be extended over two days. The counting here need not be distributed over individual hours but can be collected at the end of the day.

Utilization of Records: Using all the records at hand, a good check upon the entire working of the exchange can be obtained. If the efficiency per hour of the entire exchange is divided by the hourly standard of calls of 230 units, then we have the number of operators' hours for each individual hour of traffic. The following figures will give a further idea of the efficiencies of the exchange operators, and we have the following ratios of service:

(a) $\frac{\text{Call units}}{\text{operators' hours}}$ during heaviest traffic hours.

(b) $\frac{\text{Call units}}{\text{operators' hours}}$ during the entire day;

(c) $\frac{\text{Call units}}{\text{Operators' hours+Supervisory hours+auxiliary hours during the entire day.}}$

The value (b) will stay behind value (a); in what measure depends on the ratio of traffic during the heaviest traffic hour to the total traffic per day as also on the general plan of arrangement of hours. The figure (c) will again be smaller than (b). Between (b) and (c) there is the relation, that the efficiencies below (b) will be all the more favorable, the more the operators are supported by the supervisors and the longer hours of recreation are granted.

Operating Costs: The values (a), (b), (c) can be figured so that the number of operators' hours is given, which is necessary for the completion of 1,000 units of calls. From (c) for example, we could find how many hours of an operator, a supervisor, and an auxiliary are needed to take care of 1,000 units, when related to the total time of traffic. If we substitute the amounts for actual wages, we get the operating costs for 1,000 units. These cost figures will depend aside from the efficiencies on the hours of service per week required from operators and on the age of service of the operators.—*Telegraphen u. Fernsprech Technik.*

NIGHT CONNECTIONS FOR C. B. EXCHANGES.

In small manual telephone exchanges without night operators connections between subscribers are impossible, because there is no way of getting connection to the exchange. Nevertheless two subscribers can be connected with each other for the night after service hours. In local battery systems such night connections can be made without any trouble; the two subscribers are merely connected with each other at the exchange switchboard by means of one two-plug cord. By placing the plugs into the jacks the exchange equipment is disconnected; the two subscribers can always call each other with their own inductors; likewise they have sufficient current for microphone feeding from their local battery.

The case is different with c. b. operation, where subscribers are dependent both for calling other subscribers and for feeding the microphone on the exchange. Here permanent night connections can be obtained in two ways; by equipping the subscribers' sets with booster inductors, or else by installing special night service connections at the exchange itself. The first solution requires a change at the subscriber's telephone set. On account of greater costs this method can be used only in special cases, if the subscribers wish to have night connection for a longer stretch of time. This method does not work, when night service is asked for shortly before closing of service hours at the exchange, as then the necessary change at the subscriber's home cannot be undertaken. The second method does not show these disadvantages as it needs no change at the subscriber's telephone and requires permanent equipment at the exchange only. This method is shown in the wiring diagram Fig. 1.

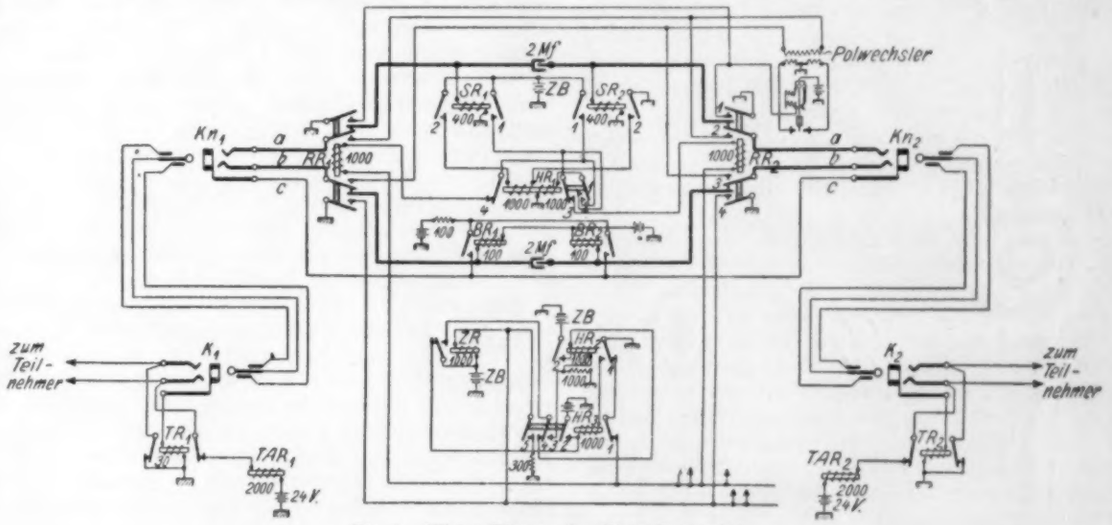


Fig. 1. Wiring Diagram for Night Connection.

The two subscribers to be connected are plugged in any desirable multiple jacks *K1* and *K2* and connected with each other by way of the night jacks *Kn1* and *Kn2*. For each night connection one pair of jacks *Kn1* and *Kn2* is required. Between *Kn1* and *Kn2* there is a special relay arrangement, embracing the following relays: (a) to each pair of jacks *Kn1 and Kn2* there belong seven relays *SR1, SR2, BR1, BR2, RR1, RR2, HR1;* (b) belonging to all pairs of jacks in common, the 3 relays *ZR, HR2* and *HR3* and a pole changer.

The conditions under which the arrangement works are as follows: (1) Mutual calling is possible from subscriber *1* to *2* and vice versa. (2) The call is started as soon as one subscriber removes his receiver and is switched off and as soon as the called subscriber answers. (3) The call remains disconnected as long as both subscribers have their receivers on the hook and is only renewed when the receiver is taken off. (4) The pole-changer for the giving of call current operates only during the call. (5) Taking current from the common battery takes place only during the call and the length of conversation.

The seven relays belonging to every set of night connections, which is divided into two halves of 2 Mf. each, according to the type of pair cords used, has the following work to do:

The relays *BR1* and *BR2* lying on the *b*-side are to bring current to the *c*-conductor and bring the subscriber-cut-off relays *TR1* and *TR2*, which are connected with the jackets of *K1* and *K2* to operate. Through this the call relays *TAR1* and *TAR2* are disconnected, consequently the usual call bridges are disconnected from the subscribers' lines.

The relays *SR1* and *SR2* branching off from the a-conductor are energized when removing the receivers at the subscribers' telephone sets and start the call of the other subscriber by way of the stop *1*, which leads to *RR1* or *RR2*. The contacts *2* are connected with a 1,000 ohm winding of *HR1*, which receives current only when both relays *SR1* and *SR2* have operated, i. e. as soon as both subscribers are at their telephones.

HR1 in addition has a holding coil, which leads by way of its own contacts *1* and *2* to the contacts *1* of *SR1* and *SR2*. As long as *SR1* or *SR2* still have the armature attracted, *HR1* cannot fall away. *HR1* interrupts when in working condition at its stops *3* and *4* the current connection to the call relay *RR1* and *RR2*.

Relays *RR1* and *RR2* look after the connection of the call current to the subscriber's line. The stop *1* belonging to *RR2* starts the pole-changer. The secondary coil of the pole-changer is connected to the contacts *2* and *3*, while contact *4* is connected to the common relay set (*ZR, HR2, HR3*).

The common relay set has the task of periodically breaking the current circuit which comes from the coil of relay *RR2*. At every break the call signal ceases. At the same time during the pause between call signals the relay *SR2* is connected by way of the back contact *2* to the a-outside wire, which gives the called subscriber the possibility, when taking off his receiver, to operate *SR2* and also the permanent disconnecting of the call by means of *HR1*. Without the rhythmical working of *RR2*, *SR2* would be connected during the call to the open a-wire. The following detailed discussion will show how the common relay set works.

The equipment is built into the exchange in the manner that a special jack strip with the jacks *Kn1* and *Kn2* is built into any of the multiple switchboards. Cables lead from these jacks to the relay sets found at the relay frame. Using two loose cords, each of which ends in two plugs, connections can be made to any desired multiple jacks *K1* and *K2* of the two subscribers' lines to be connected for the night.

Assume that subscriber *1* wishes to speak to subscriber *2* and takes off his receiver. Current will then flow from the c.b. over the relays *BR1* and *TAR1*, which lie parallel to the *b*-conductor, over the *b*-outer wire, the telephone instrument, the *a*-outside wire back to the exchange and is grounded by way of the left back contact of *TR1*. *BR1* operates and connects current by way of a 100 ohm resistance, whereupon *TR1* operates and disconnects the circuit between *TAR1* and earth. The direct current flow in the outside wire is not interrupted, since in place of the ground connection we have the coil of the relay *SR1*, which is connected to the connecting cord at *a*, and which so far was short circuited. *SR1* now operates and closes the two contacts *1* and *2*. The following current path is formed by way of contact *1*: *ZB*, contact *1* of *SR1*, back contact *3* of *HR1*, coil of *RR2*, back contact *1* of *HR3*, *HR2* and earth. *RR2* attracts its armature. The pole-changer is started by way of contact *1*, calling signal current is sent to subscriber *2*, whose cut-off relay *TR2* is already energized by way of working contact of *BR1* and the coil of the time relay *ZR*, connected to the common battery is energized by way of contact *4*.

ZR is a relay of special construction. Its armature is retarded when attracted by a small pump, in such a way that the working contact closes only after the interval of a short time, perhaps a second. As soon as this occurs, a new path is opened for the common battery over the contact *4* of *HR3*, the coil of *HR2*, and the resistance of 1000 ohms to earth. *HR2* operates and stops above the contact *2*; in addition there is an interruption of the back contact *1*. The result of this break of contact is that *RR2* receives no more current, the contact *4* of *RR2* is interrupted and consequently *ZR* loses its current. The latter releases the armature. As soon as this reaches the back contact, the common battery circuit closes over the coil of *HR3* and the working contact *1 of HR2*.

HR3 attracts its armature. Through this the connection to *RR2* is again interrupted at contact *1*, at contact *2* a stop is made, in addition, the connection starting from the working contact of relay *ZR* is charged from contact *4* to contact *3* and finally a new circuit is started by way of contact *5* and the 300 ohm resistance, within which the coil of *ZR* lies. *ZR* now begins to attract the armature anew, this time, however, slower than before, since through the booster resistance of 300 ohms the current supply is weakened, and consequently the number of ampere turns is less, consequently the resistance of the small air pump is harder to overcome. The armature of *ZR* reaches the working contact only after about 2 seconds. Now the common battery is directly connected by way of the working contact of *ZR*, the contact *3* of *HR3*, to the 1000 ohm resistance and thereby the coil of *HR2*, also connected with the common battery over the contact *2* of *HR2* is short circuited. *HR2* is currentless and releases the armature. Due to the break in the working contact *1* of *HR2*, current is taken away from *HR3* as well, and this releases its armature and has the latter return to the rest position. The current path over contact *5* is interrupted for *ZR* and the latter's armature drops. Closing the back contact *1* of *HR2* and *HR3* brings about a new flow of current by way of *RR2*, which results in the operation of *ZR*, etc. Consequently call signal impulses of 1 second duration change with rests of 3 seconds.

A change comes only after the called subscriber lifts his receiver. During the next rest pause, *SR2* is energized. A current circuit is closed over the contact *2*, the one 1000 ohm coil of *HR1* and the contact *2* of *SR1*. *HR1* attracts its armature. Through this at contacts *3* and *4* the paths to the call relays *RR2* and *RR1* are interrupted, so that no more calling current can pass. At the same time a holding coil is connected by way of contacts *1* and *2*, which remains energized, as long as one of the

contacts *1* of *SR2* or *SR1* is closed. This prevents a new call being started, if one of the subscribers hangs up his receiver earlier than the other one. Only when both subscribers have hung up, will *HR1* return to the rest position. Relays *BR1* and *BR2* are now de-energized and break the circuit for *TR1* and *TR2*. In the rest position there is therefore no consumption of current.

This arrangement can be easily applied in c.b. exchanges of larger type. If double interrupter jacks are used, the cutting-off of the usual closing signal is done in the jack; the relays *BR1* and *BR2* could be replaced by choke coils or else left out altogether. The relays *SR1* and *SR2* must then be given a second symmetrical winding on the *b*-wire side.—*Fernsprech Technik.*

USING THE TELEPHONE IN SURGERY.

Electrical processes for the location of metallic objects, such as pieces of shell in the body have been used for quite some time. The *Munich Medical Journal* some time ago published the description of an apparatus in which the telephone is used for such a purpose. No special current source is used, the body of the patient being used as source of current for the telephone finder. A piece of platinum soaked in brine is laid near the operating wound and represents with the metallic foreign object a galvanic element, in which the body of the patient plays the role of the electrolyte. A telephone is connected to this piece of platinum as also to a piece of silver wire wound around the surgical instrument, which is used by the surgeon in the wound. The telephone receiver is strapped to the head of the surgeon. As soon as the instrument comes in contact with the foreign body, the current circuit is closed and a loud tone will be heard in the receiver. This gives a good indication for the exact position of the foreign object. The process is very valuable where numerous small splinters, such as shell pieces, have to be located and removed, after an X-ray photograph has been taken and the pieces counted and then checked, as found by the telephone and removed with the instrument.

Bell Wins Spokane Merger Suit

The federal circuit court of appeals at San Francisco has set aside and dismissed a suit in which the Davenport Independent Telephone and Telegraph Company, A. T. West manager, recovered a judgment against the Pacific Telephone and Telegraph Company for $34,000 in 1915.

This case is the outgrowth of the Pacific telephone franchise controversy before the city council of Spokane, Wash., in 1914. The federal court at Portland, in its decision in the telephone merger case from Spokane, permitted a consolidation of the two companies in the city on condition that the Independent long distance companies be given connection with the consolidated exchange.

A. T. West, maager of the Davenport company, appeared before the city council a number of times to urge protection of the interests of the Independents. Toward the close of the hearing West announced that satisfactory arrangements had been made with him by the Pacific company and he withdrew opposition to the proposed franchise.

A few weeks later the sale of the Davenport company to the Pacific was announced. No transfer of the Davenport system was made and the Davenport company later alleged that the Pacific company had violated its agreement to take the property. The Davenport company then brought suit in the federal court to enforce the terms of the contract, on which they secured a favorable decision.

The Pacific Telephone Company defended its failure to take over the property on the ground that the terms of the purchase included the approval of the title to the property by the company's counsel. The title was afterward rejected and the company declined to proceed with the deal.

Daytona, Florida, Merger Nearly Completed

The negotiations for the sale of the Daytona, Florida, Telephone Company to the Southern Bell Telephone & Telegraph Company have not fallen through so far as the Florida Railroad Commission knows, and the commission has recently been advised that the terms of purchase have been perfected, contingent only upon some 15 per cent of the stock now outstanding being acquired.

F. N. Conrad, president of the Daytona Merchants bank, declared that he had recently forwarded proxies from various stockholders in different sections of the country to Mr. Armstrong of the Daytona Telephone Company. According to this condition of affairs the only contingency remaining outstanding to prevent consummation of the sale has been overcome.

The following telegram from R. Hudson Burr, chairman of the Florida Railroad Commission, should put at rest the rumors and published stories relative to the telephone negotiations having fallen through:

Have no advices that negotiations for purchase of East Florida Telephone company have fallen through, we were advised recently that terms for purchase had been perfected contingent upon Mr. Armstrong being able to turn over all stock of his company to purchasers, some 15 per cent of stock to be acquired by Mr. Armstrong before matter could be closed.

It is understood that the 15 per cent of the stock mentioned in the telegram is meant the consent of these stockholders to the sale to the Bell company. As a matter of fact there was but one stockholder who had not signed the consent and this particular stock, which consists of four shares, is owned by an estate.

Merger at Steubenville, Ohio

Local Manager H. T. Sapp, of the Central District Telephone Company, at Steubenville, Ohio, has received from the headquarters of his company a comprehensive plan for changes which are to be made in Steubenville in order to permit the consolidation of the Bell system with that of the National Telephone Company.

To permit the unification of the two systems more than $55,000 has been appropriated, much of the physical work has been done and when it is completed there will be a great improvement.

Mr. Sapp is beginning a canvass of his subscribers as well as those of the consolidated system and expects to complete it rapidly. Just before the actual change is made a new directory covering the combined system will be delivered so that from the exact time of the change full and complete service to all subscribers in Steubenville may be given.

Cleveland Claims Rate Making Power

Revision of telephone rates is to be considered by the Cleveland, O., city council. Director of Law Fitz-Gerald has ruled that the council has power to fix telephone rates, subject to a review by the courts of the state, and the committee may decide to go into the question.

Customer Ownership of Utilities

Abstract of a Paper Read Before a Colorado Association of Public Service Corporations

BY WILLIAM H. HODGE

INDUCING the consumers of public utility service to become financial partners in the enterprise is a movement which has made considerable progress during the past year. Opinions of investment bankers and many public utility operators were discouraging. Predictions were made that any scheme of broad distribution of utility securities in home territory, outside of the financial centers, would be a failure. However, the success of some companies in finding a market for stock indicates that in some parts of the country, at least, the public can be persuaded to invest in the securities of electric and gas companies which are part and parcel of their own communities. Many instances exist where service organizations enjoy a considerable home or customer ownership.

It has been demonstrated that a broad distribution of the securities of a utility company may be secured among the company's own customers by serious, careful and persistent effort over a reasonable time, or, say, a period of from three to five years. It is not sensible to expect a new movement involving the funds and savings of the people to accomplish faster headway.

BENEFITS TO PUBLIC AND COMPANIES

The benefits to the utility company and the public which assuredly will follow a wide distribution of a company's securities among its patrons warrant the effort and initial expense. The objects falling within range include the most vital things in the relations between the utilities and the people. Achievement will go a long way towards solving controversial difficulties which have marred these relations in the past.

Customer ownership is nothing more or less than a mutualization of the utilities. It means popular, but not municipal, ownership. It will give the consumer of utility service a measure of proprietorship in the service organization and render to him a share of the profits indispensable to any commercial organism which is to perform its functions to society progressively and efficiently. It will make the people financial partners in the service companies and at the same time preserve the responsibility, initiative and economy of private enterprise. It opens the door in a friendly way to every citizen who is able to produce and save a few dollars and makes him a co-operating friend instead of a suspicious, envious antagonist.

Customer ownership will not mean a license for excessive profits or indifferent service. It will not permit a corporation to obtain undue favors from the legislative bodies of states and cities. It will not give a company political security unless it keeps itself modern and efficient. But customer ownership will establish friendly connections with a large number of citizens and voters, will share with them the earnings from the business, and will so modify destructive criticism as to approach within reasonable distance of the equation which means peace, prosperity and recognition of useful service well performed. It is in line with the broadening trend of economics as we understand them to-day. It provides a simple and workable means to preserve the needful equilibrium between the producer and consumer; the natural and economical monopoly and the people.

Customer ownership will humanize the utility corporation and give the people a true understanding of corporate affairs. It will do the corporation just as much good as it does the public, and no more.

DIFFICULTIES OF PUBLIC UTILITY FINANCING

Financial conditions throughout the United States have been decidedly unsettled, owing to the great war. It had been generally impossible for utility companies to finance large undertakings for two and one-half years, except through the issue of short term coupon notes paying a high rate of interest on the cash received. The utilities, like other industries, had gone through a season of retrenchment and the careful husbanding of resources. Generally speaking, every considerable improvement which could be postponed was put off for the time when capital could be more easily and cheaply obtained. Operating companies had studied economies and perfected efficiencies as never before. There were few men who cared to predict that by the spring of 1916 financings of the largest kind could be accomplished easily and on conservative bases.

The details of a plan tried by one public utility may possess interest:

The corporate details as to holding company and subsidiaries were not touched upon, the parent concern and the operating and intermediate units simply being treated as an organization engaged in serving the public. This has been the policy at all times, and has caused no embarrassment. It was essential from good advertising and sales standards that the proposition be presented as simply and directly as possible, especially as a well-defined, if unreasonable, prejudice against "holding companies" exists. Subsequent events have shown, however, either many people have been educated to the advantages of holding company mechanism in public utility operation, or that this prejudice is not so great a handicap as is commonly supposed.

NEWSPAPER AND DIRECT-BY-MAIL ADVERTISING

The subject is one with many ramifications, and the local conditions vary greatly. It is clear that each situation is a law unto itself and must be studied individually in order to make a success of interesting utility customers as financial partners.

After the initial advertisements and circular letters the company continued to pound away steadily on the stock-selling plan. Each of the operating units regularly uses a certain moderate amount of newspaper space, and part of this has been used for advertising the preferred stock. The practice now followed is to use the regular space one full week each month at each property, eliminating the ordinary commercial advertising while the space is so employed. Circular letters, folders, etc., are also put out at intervals of about three months. Formerly some of these were mailed, but now they are distributed by the collectors or placed in the same envelopes in which the service bills are mailed. All of the circular matter carries unstamped return post cards. Most of the newspaper ads have inquiry coupons.

The reverse side of the cashier's stub is used as a means of advertising and producing inquiries. The attention of the customer is called to the advantages of the stock as an investment and he is told to "mark the square

for complete information." By placing a mark in the square he automatically makes an inquiry, which is discovered by the cashier in running over the stubs at the end of the day. The cashier then writes out the name and address of the inquirer and sends it to the manager or proper department. The left one-third of the address side of postcard bills is utilized in this manner. The number of inquiries received makes the practice well worth while. As many as a dozen inquiries on the stubs have been received in a day in a city of 350,000. A few are filled by children and unauthorized people; the majority are from people really interested.

The first few months of the campaign indicated the need of a booklet illustrating and briefly describing the properties. About the time of the funded debt financing a 24-page brochure, seven by eight and one-half inches in size, of rather unusual design was issued. It contained about 40 photographs of the properties and cities served. It gave a brief summary of the properties, described the policies of the company, had maps of the territory and lines; statistics showing the growth of the service for five years; a list of the communities served, and a concise statement of the whole situation.

It is sent with follow-up letters and used by the managers and security representatives and has assisted greatly in getting people interested and giving them an idea of the size and character of the properties. Copies are available on the counters at all of the company's offices.

Newspaper articles describing the stock-selling plan, the progress of the company, its construction plans, extensions, improvements, etc., and reviews of the annual report are supplied the newspapers from time to time and printed as news matter.

Hangers or posters worded are used in office windows and near the cashier's windows. Advertising on slides in motion-picture houses have not yet secured data which shows the results. In certain cities it seems productive, particularly so in places where, for some reason or other, newspaper advertising does not pull. Newspaper copy is freely used with a kind of advertisement that could not have been used safely at the time the stock was first offered. It was necessary to build up a good general financial knowledge of the company and the preferred stock in the public mind, and to impress upon the people the conservative nature of the investment before the copy could be made so emphatic and incisive. It was necessary also to carefully advance and describe the partial-payment plan, and familiarize the public with this particular feature prior to accenting it strongly and briefly.

EXPERIENCE WITH PARTIAL-PAYMENT PLAN

The partial-payment plan makes available, as financial partners, the great majority of people who have small incomes and who seldom or never have sufficient cash in hand to purchase a single share of stock. At first the partial-payment offer seemed to meet with some indifference. The cash sales far outnumbered those made on deferred payments, not to exceed 15 per cent of the investors electing to pay on installments during the first 10 or 11 months. In May and June of the present year a special effort was made to direct attention to the time-payment proposition, and since that time the partial-payment plan has gained steadily in favor. In June, July and August from 25 per cent to 30 per cent of the sales, but not of the amount of stock sold, were on deferred payment terms. The amount of stock sold on partial payments is about 15 per cent of the total. It is believed that the proportion of partial-payment purchasers will steadily increase. To increase the partial-payment sales, one of the chief instruments employed was a pointed circular letter, with unstamped return postcard enclosed, sent by the resident managers to customers. The securities department looked up the occupation of the inquirers on 200 cards returned, so far as possible, and noted the information on the cards. They came from people in every walk of life. The names of executives, business men, doctors, lawyers, clerks, college presidents, saloon keepers, school teachers, masseurs, railroad trainmen, housewives, laborers—skilled and unskilled—even bankers. The list was as cosmopolitan as could be imagined. Inasmuch as upwards of 60 per cent of the inquirers made an investment in the preferred stock, it is safe to say that the stockholders lists are similarly representative.

If the object of selling stock to customers is to interest as many people as possible, the partial-payment feature is a cardinal necessity. This is true, particularly in the smaller cities and the towns and the villages. The demand for capital for investment in local enterprises in the small cities is as keen as in the large cities. Every hustling little city is trying to organize factories and raise money to help secure new industries. Co-operative enterprises have their stock solicitors on the streets of nearly every town, and every citizen with a dollar is besieged to put it in some local enterprise which needs capital. These conditions mean that a public utility company has to struggle hard for local investment in a small place, and the fact that outside sources have been furnishing all the capital for the public utilities makes the effort the more difficult.

The partial-payment plan is a saving proposition. It appeals to the wage-earner who is trying to be thrifty, but who has never been expected to place money in the different local enterprises and has not done so. It will interest many who have never put a dollar in a savings bank or a building and loan association. A large amount of stock in small lots may be sold for cash in good sized cities and to a few well-to-do in small communities, but even in the large centers the partial-payment plan reaches out and offers something to the great majority to whom investment, dividends and interest are as fairy tales. A purchaser on the partial-payment plan simply pays down $5.00 a share in cash and receives a receipt upon which are recorded the succeeding monthly payments and upon which reasonable "terms and conditions" are printed.

The letter endeavors to have the prospect call at the company's office, and a great many do this at a great saving of time to the company's manager and employees. The prospects are turned over to the securities salesmen, or they are taken care of personally by the manager, or if this is impossible, by one of his subordinates who is familiar with the stock, its investment standing and the company's affairs.

In selling stock to customers it is the familiar combination of advertising and personal salesmanship that brings success. Advertising will make a certain quantity of sales, but not enough. It will, however, keep the salesman well supplied with prospects whom he knows in advance are interested and who have practically invited him to call. In selling stock to the general public, the salesman finds that he has to answer an extraordinary variety of strange questions, as well as to supply a vast amount of solid, substantial information, bearing upon the comparative investment value of the security which he is vending. The motives influencing people in making investment decisions are so many that they defy classification. A considerable proportion of the pros-

pects are women. It requires a great deal of time, patience, tact and good judgment to handle the sales work successfully, as well as a very complete knowledge of the subject in hand. The time element is the principal handicap to the work from a manager's point of view, as calls have to be made to suit the convenience of the prospect when he cannot be induced to visit the company's office.

ADVANTAGES OF SELLING PREFERRED STOCK

The favorite and established investment in many states is farm mortgages, generally yielding from six to eight per cent, and a public utility security must compete on the basis of a somewhat higher return. There is, of course, a considerable and growing bond market in the large cities, but this is not true in the smaller cities. Moreover, the partnership or profit-sharing idea is wholly consistent only with equity ownership—through stock.

The appeal of the seven per cent preferred stock is to the broad class lying between those who invest in ultra-conservative types of securities, such as municipal bonds and mortgages on the one hand and the speculators who are looking for larger than ordinary returns on the other.

Operators Make the Best Wives

Why not marry a telephone girl? Not that this is a startlingly new idea. For telephone girls have been married in great numbers. They usually marry after two or three years of service. But having recently looked over a whole exchange full, I am impressed with the idea that they would make excellent wives, writes Zoe Beckley in the New York *Mail*. And I shall tell you why:

1. Only girls in robust health are chosen as operators.
2. Only those of mental and physical alertness survive their apprenticeship.
3. Telephone girls keep their heads.
4. Telephone girls are amiable. (And maybe this ought to be put first instead of fourth.)
5. Only girls who are amenable to reason and guidance are selected.
6. Only girls who apply to their clothing the principles of common sense, good taste and thrift keep their places at the switchboard.

And if these are not enough reasons why you should marry them, I may add that 80 per cent of central office girls are attractive in looks and pleasant of manner.

As for choice in types and coloring—Say! Get the telephone company's permission some time to go through the exchange.

The blondes and the redheads are my choice. But, of course, you may prefer the raven tressed, the chestnut thatched or the browns. As a matter of fact, you are safer to pick out the medium shades, Miss Schmitt says.

Katherine Schmitt has been employing girls for the telephone company a good many years. She began like the girls she now trains and advises—at the "B" switchboard.

Miss Schmitt says the medium tinted ones "wear the best," all things considered. Any one extreme in coloring is apt to be more extreme in temperament.

As we made our rounds, Miss Schmitt threw open the door of the vast room where incoming calls are received. The view different from a Ziegfeld chorus is, that instead of pretty faces, one saw only pretty back-of-heads. There appeared to be hundreds ranged round the sides of that enormous room. It was a study in cream blouses, dark skirts and feet—feet that were crossed for the most part on a rail that runs at the proper height all round.

"This is the only room you'll find in a day's journey," said Miss Schmitt, "where you could have a fit, say right in the middle of the floor, and not a head would turn to look at you!"

"How about a shout of 'Fire!' or the cry of 'Mouse! Mouse!'"

"Wouldn't bother them in the least," said my guide confidently. "They are trained to composure under any circumstance. You can talk as loudly as you like or read a newspaper aloud, with all the latest war news and fall fashions. I guarantee not one girl will turn around in her chair and look at you."

"Do you have to train them into this military precision and discipline? Or are they just born with good dispositions and balanced minds?"

"Both," said the little woman quite promptly. "I've had long training myself in sizing up human nature. I hardly ever make a mistake reading a girl's temperament. You must have special fitness for this work. You must have health, intelligence, common sense, poise and patience enough to offset the irritability of some short tempered person at the other end of the wire.

"All this can be developed, if there is something to work on in the first place. A girl who has been three years at the switchboard has a better disposition than when she started!"

I had heard a great deal about the romantic side of telephone operating—how stock brokers and other millionaires fell in love with the "voice with the smile," the mysterious girl who lives in their consciousness only as a Silvery Voice. I asked Miss Schmitt about that and was greatly disappointed when she said: "Nothing in it. We discourage romance by wire. It interferes with efficiency. A busy girl cannot and does not wish to mix business with sentiment. They are trained to politeness and poise. Beyond that there are no—er—amenities."

"But they all marry off in no time, don't they?"

Miss Schmitt pursed her lips and raised her brows at me.

"Alas—despite the good example I set them, they do!" she answered, and a smile escaped. "They last, on the average, about three years, that is, they mostly leave after about three years of service.

"To marry, I suppose," she added.

Ohio State Salesmen Organize

An organization of the salesmen of the Ohio State Telephone Company's Youngstown branch was perfected when the seventeen local salesmen met in the company's East Rayen avenue building and elected officers.

The organization is the first of its kind in the state, the officers say, and was brought about for the betterment of the salesmanship abilities of the men. Bimonthly meetings will be held on the first and third Thursdays of each month, a supper to be included in the second meeting of the month. The plan is to have all local salesmen meet at these sessions and talk over the questions that confront them during the week with a view to having them solved by the membership.

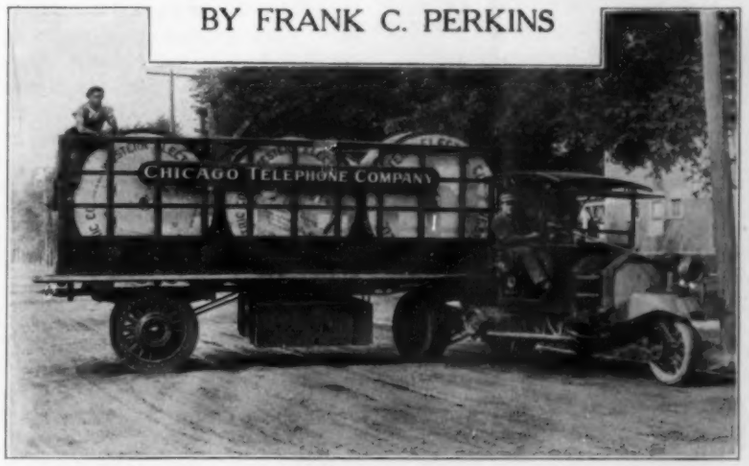
The officers elected were: D. J. Connor, president; F. Schwartz, first vice-president; F. Gates, second vice-president, and J. E. Gargail, secretary.

Cable-Handling Motor Trucks

Two Examples of Efficient Tractor Vehicles Used by Operating Companies

BY FRANK C. PERKINS

THE construction of a three ton gasoline truck utilized by the Mountain States Telephone & Telegraph Company at Pueblo, Colo., including the details of the haulage mechanism used in stringing wires and cables, is shown in the two illustrations at the bottom of this page, while in the picture at the top may be seen the form of gasoline tractor utilized by the Chicago Telephone Co.

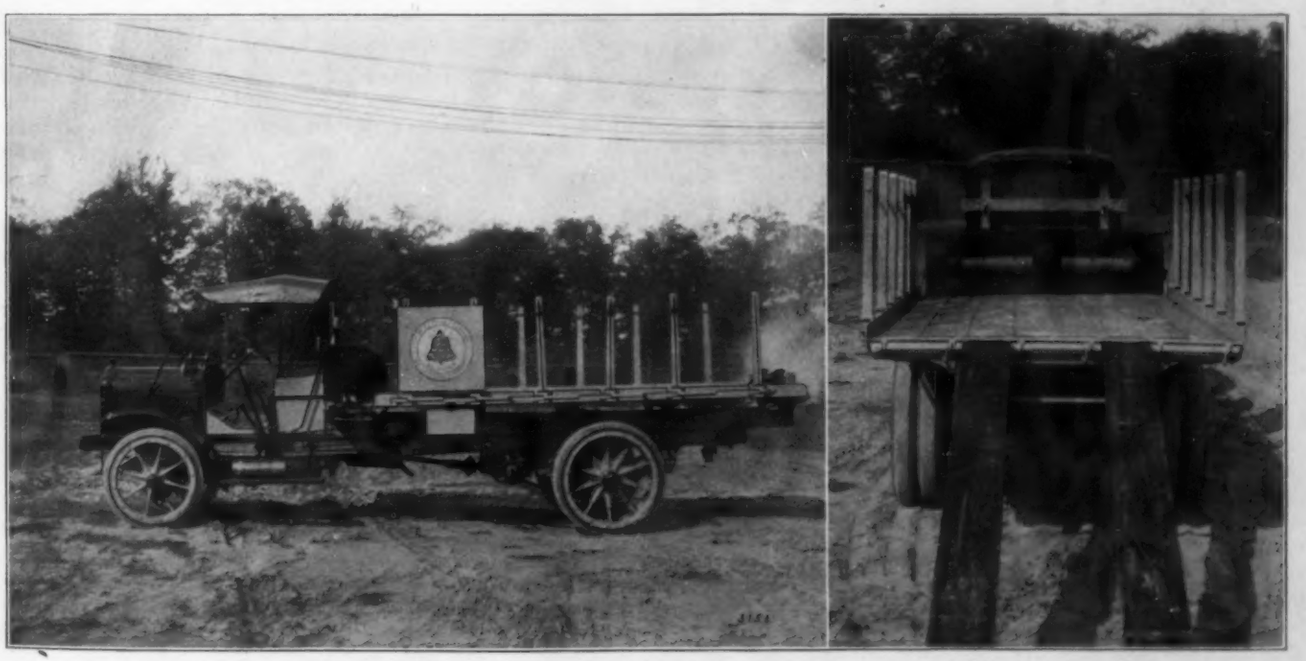


Gasoline Tractor Type Used by the Chicago Telephone Company.

It is evident that this tractor is a motor unit that may be attached to any heavy vehicle that is designed to be drawn by horses, the combination making a five-wheeled motor drawn vehicle. It is easily atached. The foot springs of the trailing vehicle are connected to the tractor axle by means of a fifth wheel. It is claimed to be better than the ordinary motor truck because it eliminates many of the complications of ordinary motor truck construction, and at the same time gains in efficiency. The first cost is lower and the upkeep cost proportionately lower, and it saves heavy maintenance charges due to excessive vibration on stiff springs. The tractor is carried on exceedingly resilient springs, because they do not support one pound of the load carried.

It is said that it saves heavy maintenance charges due to sudden starting or stopping of heavy loads, cushioning the shock between the engine, the load being one of the most important advantages gained. It saves heavy maintenance charges due to frame twist. The tractor accommodates itself to all road unevenness.

For cooling the engine water circulation is used and a centrifugal pump is driven by helical gears from the cam shaft through a safety flat spring coupling. This flat spring will snap by if the pump freezes or becomes clogged, and thus any damage to the blades, shaft or gears will be avoided. The chamber can be drained by means of a valve or the pump can be entirely detached by removing two bolts. The water from the pump passes through a tapered manifold to the lower end of each cylinder jacket, then around the cylinder and out the upper end, through an outside connection, to the lower chamber of the valve head. Here the water flows directly over the valve seats keeping the valves, built without cages at the proper temperatures. The return is through the upper



The Three Ton White Truck Used by the Mountain States Telephone and Telegraph Company, with Rear View Showing Winches for Handling Cables and Wires.

valve headchamber to the top of the cellular radiator by way of the return manifold. The cooling system is aided by a special three-bladed fan.

The spark and throttle are controlled by levers on the steering wheel. The throttle is also controlled independently by a foot accelerator pedal. The normal speed of the motor while running free is determined by the position of the levers and the speed of the vehicle on the road is controlled by the right foot. The clutch and service brake pedals are at the back of the steering column while the gear change and emergency brake levers are directly beside the driver. On the road, with the exception of the gear changes, the vehicle is controlled by the feet and both hands are free for steering.

The lubrication system is of the improved De Dion type. The oil from the crank case is forced to all bearings by a gear-driven pump. Excess flow of oil controlled by a spring retained check valve; the amount of pressure on the system is indicated by a dial on the dash-board in front of the driver. Oil is strained twice, used and returned to crank case to be circulated again. Oil pump is driven by a safety spring coupling same as water pump. The oil screen is easily detached. The oil pump automaticaly varies the supply of oil in proportion to the speed of the motor. This has proven a most economical, efficient and reliable system.

These tractors are equipped with a centrifugal governor designed to regulate the maximum motor and vehicle speeds. It automatically actuates an auxiliary throttle in the main gas inlet; is of high speed type, and thus prevents surging of the engine. The governor is sealed in a housing to prevent readjustment for increasing speed in excess of the proper limit.

The transmission is of the selective sliding gear type with three speeds forward and one reverse. The shafts are very short and stiff and the bearings adjustable for end as well as radial wear. The frames are made from very heavy rolled, 5-inch channel section structural steel, drilled, hot-riveted and braced by gusset plates while a rigid stabilizer bar extends across between the forward strut rod brackets, preventing the tractor from swaying or leaning. There are semi-elliptic springs in front and cantilever springs in the rear and these springs are very resilient as they have only the weight of the power plant to carry.

This tractor has two sets of brakes with a service brake which is foot operated and composed of a wide raybestos-lined contracting band acting on a large drum. The emergency brake is of wide surface and large diameter and expands in rear wheel drums. These tractors are not only used by telephone companies and other public service corporations but by municipalities for hauling fire fighting equipment to great advantage utilizing existing ladder trucks and fire engines.

Operators Must Have Lace Curtains

Woman's right to have the last word and to exercise her prerogative over man in taste and judgment of the artistic is being demonstrated at Cleveland's new $3,000,000 city hall.

In creating the substantial beauty of the building, the architect failed to include curtains. They don't look business-like. But he also failed to consider the eternal feminine—the temperament of the telephone girls in the city hall exchange offices. They must have curtains. So they installed, or rather, hung some up.

"Looks to me like gilding the lily," said Assistant Custodian Beckett. "However, 'twill take a braver man than I to object."

Los Angeles Merger Moving Fast

Application for the transfer of the franchise of the Los Angeles (Cal.) Home Telephone Company to the Southern California Telephone Company, the new corporation under which the Home and the Pacific (Bell) companies are to be merged, was filed with the city council November 14.

The application, it sets forth, is in conformity with the terms of the Home franchise, which specifies that the council must first approve the transfer of the franchise before the Home company can be merged with any other company. The state railroad commission's approval has already been granted, subject to the filing of certain stipulations in regard to universal service, no increase of the rates for five years, and operation of the merger company as a local corporation.

These stipulations have already been filed with the state railroad commission and, as soon as the city council acts on the merger, application will be made to the department of justice at Washington for similar permission.

The franchise of the Pacific Telephone Company has expired and it is desired that the council act as speedily as possible in order that the anomalous situation created by the lapsing of the Pacific franchise may be rectified.

Accompanying the application of the Southern California Telephone Company for the transfer of the Home franchise to the new corporation is an extended argument in favor of the merger by the company, in the form of memoranda to the council.

In this memoranda are statements of the railroad commission, the order of the railroad commission permitting the transfer, and a copy of the stipulations filed by the company with the railroad commission; a brief of the Home franchise; a statement by Seward C. Simons, secretary of the Municipal League, and a statement of the position of both the Home and the Pacific Telephone Companies, and of the Southern California Telephone Company's willingness to conform to conditions imposed upon it by the council.

That the issuance of a new franchise, under an interchange of service agreement between the companies, would be more expensive to the subscribers and would require extra charges for calls between the two companies, while under the merger plan there would be no extra charge for interchange of calls between the two existing systems, is asserted in the companies' memoranda.

M. Adrian King, who originally secured the Los Angeles telephone franchise before it was assigned to the Home Company, injected a new angle into the present telephone controversy.

Mr. King filed a formal communication requesting the city council to advertise for sale and sell a telephone franchise to construct, maintain and operate a telephone system within the present boundaries of Los Angeles.

Mr. King submits the draft of a proposed ordinance to cover the desired franchise as he says he would like to bid in, construct and operate a system.

Mr. King says, "As I am the originator of and the grantee of the present Home telephone or King franchise and as I am under a $25,000 bond to the city for fifty years for the faithful performance of my assignees, the Home Telephone Company, my good faith with the city of Los Angeles, in the past, has been proven, and my sincerity in this application is, from my record, beyond question."

Federal Versus State Regulation

Various Opinions on Railroad Control That Are of Interest to Telephone Men

RESOLUTIONS from trade bodies requesting further action by the Chamber of Commerce of the United States on the railroad situation were a forerunner of the meeting of the Chamber's National Council held in Washington November 17 and 18. In addition to the National Council meeting November 17 and 18 provision was made by the National Chamber for a committee to study the railroad problem in all phases pursued by the joint congressional committee of which Senator Newlands is chairman and which convened in Washington November 20.

The Railway Business Association favors an investigation upon correction of defects in the system of railway regulation. It advocates especially that the national government should on behalf of the states regulate instrumentalities of interestate commerce except in those spheres which are distinctively state. Also that Congress, in order to keep regulation close to the people, should create regional sub-commissions, appointed by the President and subordinate to the Interstate Commerce Commission, to conduct administration over areas corresponding to traffic movement. Finally, it is recommended that Congress having chosen to leave to private capital the function of providing the people with rail highways, should insure reasonable extensions of such highways into new regions as well as the improvement of existing roads by declaring it by statute the policy of the government to permit such a system of rates as will yield earnings sufficient to attract investment for new construction.

The Merchants' Association has declared in favor of giving the federal government, through the Interstate Commerce Commission, control over railroad rates and regulation within state limits. This would do away with a large number of vexatious matters arising from the conflict between federal and state authorities. The Merchants' Association is in favor of the federal incorporation of railroads; federal supervision of the issue of securities by interstate carriers; the enlargement of the Interstate Commerce Commission so as to enable it promptly and adequately to perform its functions; and strongly opposes government ownership of public utilities.

Addressing the National Council, Representative Adamson declared that the plea of the railroads for release from forty-eight jurisdictions beside the Interstate Commerce Commission cannot be favored without an amendment to the Constitution of the United States, since it is the undisputed power of each state to regulate commerce within its borders.

Nor is government ownership feasible according to Mr. Adamson, since the government would have to appropriate the necessary funds and then employ the present railroad officials to carry on the work; thus placing greater power in their hands, and running the risk of building a powerful political machine. Mr. Adamson believes that the trouble can be relieved by an enlarged Interstate Commerce Commission, with members sufficient to allow groups to go to different parts of the country and hold hearings and take testimony wherever disputes arise.

Alfred P. Thom, general counsel of the Railway Executives' Advisory Committee, said the railroads want the Congress of the United States to exercise full constitutional authority in regulating interstate commerce in the interests of all the states and all the people. They want a system of federal incorporation and all railroads during interstate or foreign trade shall be subject to regulation in all their parts.

Mr. Thom stated that the railroads believe that the Interstate Commerce Commission is not now equipped for this work; that the powers of the Commission should be extended; that the country should be divided into traffic regions with a commission for each region. The members of the commissions would be appointed by the President and confirmed by the Senate. Such an arrangement would permit the commissioners to become acquainted with regional conditions, take testimony on the spot and make authoritative reports to the Interstate Commerce Commission, which could, in turn, make regional regulations harmonize all over the country. The Interstate Commerce Commission would be given authority over minimum rate as well as maximum.

Mr. Thom believes that a commission concerned wholly with corrective and penal measures in connection with the railroads cannot turn readily from this attitude to an attitude of constructive work in behalf of the railroads and believes that the Interstate Commerce Commission should be broadened to counteract this condition. The plan advocated by the railroads would free them from state regulation. He pointed out that 85 per cent of the commerce of this country is interstate and foreign and only 15 per cent intrastate, but that the narrow policies of one state under present methods can inflict hardships upon the commerce of all other states.

In this respect, of course, the railroad business differs from the telephone business.

Mr. Nichols of the Electrical Manufacturers' Club of New York, offered a resolution suggesting the creation of regional sub-committees of the Interstate Commerce Commission to conduct hearings.

THE JOINT CONGRESSIONAL INVESTIGATING COMMITTEE.

Some of the principles which the railroads believe should be included in any just system of regulation were outlined on November 25 to the joint congressional investigating committee by A. P. Thom, counsel for the railway executives' advisory committee. The principal features were:

The entire power and duty of regulation should be in the hands of the national government, except as to matters so essentially local and incidental that they cannot be used to interfere with the efficiency of the service or the just rights of the carriers.

As a means to accomplish this end, a system of federal incorporation should be provided to cover all railroad corporations engaged in interstate and foreign commerce.

Reorganization of the Interstate Commerce Commission and creation of a new federal railroad commission and regional commission subordinate to it. Power to be given the Interstate Commerce Commission to prescribe minimum rates and power of rate suspension in the commission to be reduced to sixty days from the time a tariff is filed instead of ten months, as at present.

Exclusive power should be in the federal government to supervise the issue of interstate carrier securities.

Mr. Thom continued his argument that regulation of

interstate commerce by the federal government would not invade the rights of the states, but merely carry out the express purpose of the constitution. He said it was not the purpose of the railroads to enter upon a policy of abolition or obstruction of state commissions and he believed they would continue to occupy a large field of usefulness. But vesting the federal government with the regulating power would make it more businesslike by removing it from the influence of local policies and politics.

"It would furnish," said Mr. Thom, "a surer basis for the confidence of the investing public, because more reliance could be put upon the judgment of the whole nation as affecting a matter of nationwide consequence than could be placed in the varying judgment of different local authorities, but it will be necessary to go much further than merely simplifying and concentrating regulation. It will be necessary to introduce into the system of regulation by the national government those elements of constructiveness and helpfulness which are essential to the continued growth and efficiency of the instrumentalities of commerce."

THE NATIONAL ASSOCIATION OF RAILWAY COMMISSIONERS.

At practically all of the sessions of the National Association of Railway Commissioners from November 14 to 17 inclusive, the topic of discussion was the inadvisability of exclusive federal control of interstate carriers and other utilities. The association was in general opposed to any abolition of the present dual system of regulation, and it favored legislation by Congress authorizing the courts to determine which is the reasonable rate in the case of conflict between federal and state commission orders.

Patrons of a public utility are more dependent upon the public service commission in the matter of correcting unsatisfactory service than they are in the matter of securing reasonable rates, in the opinion of the committee on public utility service. The report described the general features of commission work in checking and regulating service, and then took up in detail questions arising in connection with different classes of utility service.

The committee made the following general recommendations, which were adopted by the association:

1. That the matter of regulating the service of public utilities, other than steam railroads, be vested (as is now done by many of the states) in the public service commissions of the various states.
2. That each state commission establish standards of service for each class of public utilities within its jurisdiction.
3. That inasmuch as some kinds of public utilities are not confined to state boundaries, some uniformity of standards is desirable, to the end that a single enterprise, doing business in several contiguous states may not be required to observe a different standard in each state.
4. That each state commission prescribe forms, upon which the various classes of public utilities shall be required to keep a record of the important factors that indicate the character of the service of such utility.
5. That each committee establish and maintain a service division to inspect and from time to time determine the quality and character of the service furnished by the various public utilities.
6. That each commission recognize at all times the importance of adequate service to the public, and that it take such steps as may from time to time be necessary to insure the furnishing of adequate and efficient service by public utilities.

The action of the association on the report on statistics and accounts was confined to referring to the executive committee the section dealing with the organization of a separate association of commission statistics and accountants, and that dealing with the question of federal commission jurisdiction over local utilities incidentally engaged in interstate commerce, and also to merely receiving the remainder of the report without adoption.

At the beginning of the convention R. C. Prentis, Virginia, president of the association, in his opening address opposed exclusive federal control of interstate carriers. He said there is an organized movement having for its ultimate object the absolute elimination of the state commissions from all jurisdiction over interstate rates, and that the movement was inspired and fostered by the railroads. If the movement should succeed the work of the last thirty years in building up state regulation would be lost. The most serious complaint now made against the present dual system of regulation was the lack of uniformity, but it would not be wise to destroy the very agencies through which such uniformity as did exist had, in great measure, been secured. The association adopted a resolution to the effect that for the settlement of disagreements between federal and state commissions, Congress should restore to the courts the power of saying what is a reasonable rate.

Among the recommendations of the committee on capitalization and intercorporate relations were the following:

That the Interstate Commerce Commission or some other federal agency be empowered to regulate the rates, practices, and bonds of the interstate public utilities.

That Congress enact the necessary legislation to provide for a national incorporation act for interstate railroads and interstate public utilities.

That federal and state statutes be amended, where necessary, to permit of the issues by railroads and public utilities of a common stock without par value.

That the Interstate Commerce Commission and the state public utility commissions by permitted to invoke the aid of the Federal Trade Commission to determine the reasonableness of the cost of essential materials of railroad and public utility construction.

That adequate legislation be enacted, both national and state, to provide for voluntary wage agreements; methods of arbitration, and for federal and state intervention in emergencies, to adjust wage conditions in the railroad and public utility service; nothing contained in such legislation to require men to work against their will.

The officers elected were: President, Max Thelen, California commission; first vice-president, E. C. Niles, New Hampshire commission; second vice-president, C. E. Elmquist, Minnesota commission; secretary, W. H. Connolly, Interstate Commerce Commission, and assistant Secretary, James B. Walker, New York commission, First District.

Central Union Buys Piqua Home

Following the arrival in Piqua, Ohio, of a number of officials of the Central Union Telephone Company, announcement was made of the proposed arrangements for the consolidation of the properties and service at Piqua by combining the present exchanges of the Piqua Home Company and the Bell Company.

At a recent meeting, the stockholders of the Piqua Home Company voted to sell all the telephone property of that company to the receivers, Central Union Telephone Company, for $102,500 in cash. The property to be purchased includes the exchange plants of the Piqua Home Company at Piqua, Lena and Fletcher, and all rural and toll lines owned by it.

An additional sum approximating $130,000 will be spent in improvements and extensions at Piqua, Lena and Fletcher. The new money will be spent to provide a new switchboard and complete new central office equipment at Piqua and a large amount of new outside plant, including new cables, etc.

The Principles of Depreciation Accounting

Three Primary Methods Explained in Industrial Management

BY ROBERT G. KLOTZ

ANY physical property, whether subjected to direct usage or not, may with the aid of suitable repairs, be kept in stable, or good operating condition for a certain period of time, depending upon the character of the property and the manner in which it may be used or the stresses to which it is subjected by ordinary conditions. At the expiration of that period it will be found that the cost of the repairs required to keep the property in use, or in existence, will be too great to warrant the further use or retention of the property if the question of economy is to receive any consideration, and that the property will have to be replaced in its entirety if its original purposes are to continue. This gradual and unavoidable deterioration is known as depreciation.

If no provision has been made to meet the cost of the replacement of property which has depreciated to the end of its useful life, it will often be found that the necessary expenditure for this purpose will materially reduce the profit during the year in which the replacement is made. The need has become apparent, therefore, of providing for such expenditures through some means of distributing them over the years in which the depreciation was taking place, in order to avoid the possibility of having to incur heavy charges during one particular year and to apply the expenditures properly to the purposes for which they were actually incurred.

The customary method of providing such funds is through the aid of a separate account, known as the "depreciation account," to which is periodically applied a sum of money, the accumulation of which will be sufficient to provide for the replacement of the property when its useful life shall have expired.

Owing to the fact that it appears to those not definitely acquainted with its purposes to deduct a certain arbitrary amount from the annual profit, and that it often requires the periodic idleness of certain funds, every effort should be made to hold the amount to be thus applied at the minimum possible figure.

The probable useful life of plant units may be dependent upon a number of circumstances: Some property may depreciate at a constant rate, whether subjected to use or not; while that of a different character may deteriorate in direct proportion to the extent to which it is used.

For most types of structures and equipment, particularly such as may be considered standard, statistics are available to show the approximate life which may be expected under ordinary conditions of use. These will often be of value in determining in a general way the powers of endurance of such property, but they should not be used without due regard to the conditions of operation likely to be encountered in each case under consideration and to the definition of the term "life" as it has been used in their compilation.

For accounting purposes the depreciation of property is usually assumed as taking place on a straight line basis; that is, the loss in value due to depreciation is assumed to be constant for each period, so that a plotted curve showing the depreciated value of the property for each period during its life will form a straight line.

In addition to the losses due to physical depreciation, property (particularly machinery), may be subject to loss due to replacement in its field by machinery of a type whose improved economy renders the plant of the older type obsolete, although its productive power may not be impaired. This reduction in economy, when it is sufficiently great to render the further retention of the older type of plant unwarranted, is known as *obsolescence*, and will in certain cases have to be provided for in a manner similar to that in which the depreciation loss is recovered.

Provisions for obsolescence should, however, be kept entirely separate from provisions for depreciation, as the courts, while they are willing to concede the correctness of proper allowances for depreciation, since they are based on facts determined by experience, will rarely, if ever, feel disposed to consider obsolescence as based in any way on fact, and will accordingly consider such allowances doubtful at best.

In arranging a depreciation account it will first be necessary to tabulate all of the physical property that is subject in any way to depreciation, showing the cost and the probable useful life of each unit or group of units.

The next step will be to determine whether or not the life as so stated will include the replacement, under the heading of repairs, of any parts of the units at so great an expense as to render the repair account excessively high for the year in which the replacement will be made.

The usual procedure among accountants is to consider the life of an entire unit as equal to the life of the least durable part whose cost of renewal is high enough to warrant its removal from the classification of repairs. The cost of replacing the part is then taken from the fund accumulated by the depreciation account and the procedure defended by contending that the "life" of the unit has been extended by the replacement of the part.

By considering as a renewal, that is, as a repair properly payable from the depreciation fund, every repair costing more than a certain specified amount, accountants claim that they make due and proper allowance for heavy repair charges which would otherwise be unprovided for and tend to unbalance the total charges for the period. What they actually accomplish is merely the transference of the periodic heavy repair charges from the repair to the depreciation account. When the time for the replacement of the entire unit arrives, the amounts deducted for depreciation will be found to have been excessive and the profits in the meantime will have been kept below their true value.

It is perfectly proper to accept at the start the determination to consider as a renewal, payable from the depreciation fund, any repair or replacement of a part costing more than a specified amount, provided that the parts so to be replaced be considered as separate units as far as the depreciation account is concerned. In this way only can the charges for expensive repairs be properly and accurately provided for.

The attitude of accountants on this point is due in great degree to a misunderstanding of the term "life" as it should be understood in connection with depreciation accounting. As the purpose of the depreciation account is primarily to provide for the distribution over the intervening years of the cost of replacing an expensive unit when it can no longer be kept serviceable by repairing,

the inclusion therein of the cost of the repairs which can and do keep the unit serviceable, and are therefore responsible for the life originally assumed, is obviously very poor practice.

The absurdity of the "extended life" principle will be evident if we apply it to such an item as a motor car.

If we are operating a car costing $3,000, with an estimated life of ten years and a scrap value of $200, and decide to consider as a "renewal" the replacement of any part costing more than $25, the replacement of a tire costing $50 will have to be paid for from the depreciation fund which is accumulating at the rate of $280 per year. It would not be assuming too much to consider that two complete sets of tires would be required each year, and this would mean a deduction of $400 per year from an account which is being provided with only $280 during that period. As the life of the machine as an operating unit is in no way dependent upon the tires, the depreciation fund, created to provide for the replacement of the unit on the expiration of its useful life, would consist of a $1,200 deficit at the end of the tenth year.

On the other hand, if we take the accounting viewpoint of the term "life," the life of the machine will have to be assumed at the start as equivalent to that of one of the tires, or six months, and the depreciation fund will have to be enriched during that period to the extent of the first cost of the machine, an absurdity on the face of it. Extending the procedure, however, we find that at the end of the tenth year the amount of the accumulated depreciation fund is approximately $6,075; in other words, in order to provide for the payment of heavy repair charges from the depreciation fund we have deducted from the true profit more than as much again as was actually required to provide for the replacement of the unit. The great excess in this case is due to the extremely short life of the renewal item as compared with that of the machine as a whole. Even if the life of the tires could be assumed at five years, the excess in the depreciation fund at the end of the tenth year would amount to $1,280.

The rational procedure in practice would be to write up the depreciation on the remainder of the machine separate from the tires, and to provide a separate fund for the tires (if the depreciation be written up at short enough intervals) or to consider the tire replacements as simple repairs.

While the above must be considered an extreme example, the principles involved will be the same in every case, and the error which is brought in will vary only in extent with the variations in the relation between the life of the part and of the whole.

From the foregoing it may well be seen that the "life" of any plant unit may depend upon the manner in which the depreciation account is to be administered as well as upon the purely physical characteristics of the unit, and it should always be made clear at the start just what the term "life" shall be understood to mean. Otherwise an engineer may specify the estimated life which a unit may be expected to show with reasonable repairs, only to have an accountant assume that all these repairs may be paid for from the depreciation fund on the assumption that the life will thereby be extended proportionately. In such a case the depreciation fund will not be sufficient to provide for the renewal which will have to be made at the time originally estimated by the engineer, and not at the end of the period through which the repairs charged as renewals have apparently extended its life.

Under all circumstances it must be borne in mind that if the depreciation account is to serve its avowed purpose of distributing the cost of the physical depreciation of the plant over the activities in connection with which it was incurred, and of doing this with some degree of accuracy, the replacement of plant units or parts thereof may be considered as renewals. In this case they may be so paid for out of the depreciation fund providing the unit or part so replaced has constituted a definite unit under the account, and has as such been subjected to suitable charges to provide the fund for its replacement at the end of its useful life.

From this it might appear that the establishment of a properly outlined depreciation account would constitute a rather complicated procedure, and such is very likely to be the case if the different persons concerned in its establishment are neither capable of nor willing to approach the subject on a basis of mutual understanding and to regard it from a practical and commonsense point of view.

The probable useful life of any piece of property may be determined with some degree of accuracy; but even with the most accurate of estimates it will often be feasible to shorten or extend the life of a unit before or beyond the time first assumed as marking the end of its profitable existence. It is also often possible to foresee certain extensive repairs which certain units will require and, by so ordering the time at which they will be made, to counter-balance those which will be required by other units during other periods.

For example, if we find that two exactly similar units will require extensive and expensive repairs within a certan period and under normal conditions, we can, by varying the conditions, slightly from the normal, or, as one might say, by nursing one of the units, arrange to carry out the repairs on the two units in two different accounting periods, and thereby avoid the unbalancing to which the accounts would have been subjected had the cost of both sets of repairs been incurred at the same time. In the latter case it would, of course, have been necessary to provide for these repairs as renewals by means of the depreciation account.

The same means could also be used to provide for the distribution of the costs of the replacement of different units over different periods, the limiting condition being the maximum charge which it is possible to incur durng a certain period without a resultant unbalancing of the accounts. In *some* cases it might even be possible to carry out this balancing of the repair and renewal costs for different periods to such a desirable conclusion as to do away entirely with the need for a depreciation account. While it may not often be possible to attain such a perfect result, the effort to do so will tend to provide a most desirable depreciation account because of its simplicity and the smallness of the total amount of charges involved.

Numberless instances arise in which the replacement of a number of small and similar parts which go to make up a part or the whole of an operating unit may be distributed over a considerable space of time under the heading of repairs with remarkable simplicity, as far as the accounting is concerned, and with better operating conditions maintained than would be the case were the small parts regarded as a collective whole, covered as a unit in the depreciation account, and their renewal postponed until their general poor condition absolutely required it.

No matter in what way the depreciation account may be administered, the total cost of maintaining a unit during any one period will be equal to the sum of the depreciation charges and the amounts expended for repairs. As the repair charges on any piece of property will almost

invariably be less during the earlier than during the later years of its existence, the total maintenance cost, if the depreciation charges are uniform, will show a gradual increase with an apparent profit during the earlier years which the later expenses will prove to have been excessive.

It is with a view to combatting this unmitigable increase in cost that accountants have developed the extended life procedure previously discussed.

It is evidently impossible to forecast with absolute accuracy the extent of the repair costs which will be involved in the maintenance of any property and, strictly speaking, there can be no arrangement of accounts, therefore, whereby the total cost of maintaining a certain unit may be kept absolutely uniform from period to period, although the system of arbitrary limitation of the cost, which shall be included under the heading of repairs and depreciation on the resultant small items, will provide for very close regulation. The total loss due to depreciation will obviously be the difference between the original cost of the property and such returns as may be obtained from its sale as scrap.

In determining upon the scrap value of a unit, care must be observed not to overlook certain items which will have a tendency to reduce or to obliterate that value. If the removal of the unit will involve considerable effort, and if the cost of the removal has not been provided for in the scrap value as stated, it is quite possible that the entire amount derived from the sale may be wiped out by the cost of accomplishing it.

In the original installation of a unit some intangible items, as for instance Engineering and Superintendence, may have contributed materially to the cost. If similar charges will be incurred in connection with the renewal, the original cost of these services will have to be omitted from the scrap value and included in the depreciation charges. Where the benefits derived from the services will be retained and the cost thereof will not have to be reincurred in connection with the renewal, those items may be included in the scrap value and not provided for in the depreciation account.

For example, if the installation of an engine required a charge for services under the head of Superintendence and another charge under the head of Engineering, it would very probably be found that the Superintendence item included in greater part the direction of the labor employed in the installation, while the Engineering item covered the cost of locating the unit in its proper position. In the replacement of ths unit with an exactly similar one it may be assumed that the charge for Superintence would have to be incurred again, but that the benefits derived from the charge for Engineering would still exist and would not have to be reincurred. In such a case the Superintendence cost would have to be depreciated, but the Engineering would retain its full value and, hence, could be included in the scrap value.

Owing to the fact that equipment renewals are rarely made along the exact lines of the original installations, such instances as that described will not often be encountered, but the principles will be met with mostly in connection with the engineering charges on the permanent locations of manholes, duct lines, etc., where the renewals are generally made along the same lines as the original structures.

It may be assumed, therefore, that all charges incurred in connection with an installation which will not have to be incurred again in the renewal shall be included in the scrap value, and that all other charges of the same general character shall be considered as part of the value lost through depreciation.

All of these more or less intangible values will depreciate to the extent of their full amounts almost immediately, as would be evident were some unforeseen circumstance to require the renewal of the plant immediately after its installation; but in view of the fact that this loss will not be felt until the time for renewal is at hand, it is customary and proper to provide for this loss along with the depreciation of the other items.

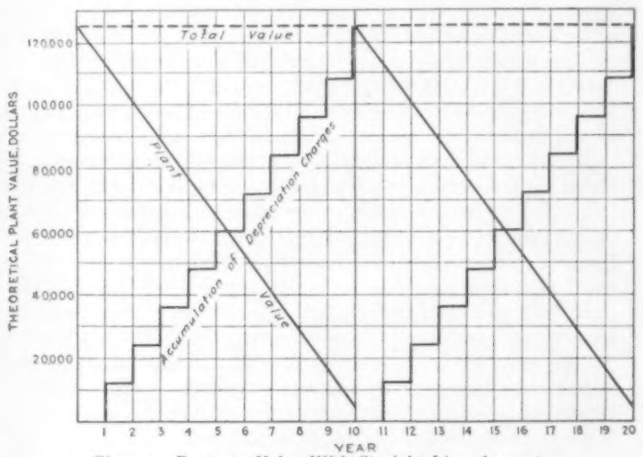


Chart 1. Property Value With Straight Line Account.

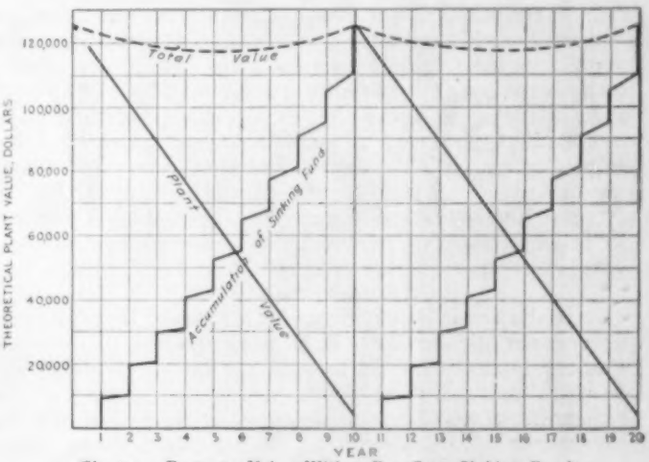


Chart 2. Property Value With 5 Per Cent Sinking Fund.

With the probable useful life of the plant and the total loss on account of depreciation during that time fully determined, it will next be necessary to decide in what manner we shall arrange to accumulate the sum which will be required to meet the outlays for renewals as they become necessary.

STRAIGHT LINE SYSTEM.

The simplest procedure would be to lay aside during each accounting period a sum bearing the same relation to the total loss as the accounting period bears to the total useful life. This is known as the stragiht line method, as a plotted curve showing the total amount so accumulated by the end of each period will form a straight line. (Chart I.)

This system has the disadvantage that the sums so laid away, and therefore deducted from the earnings, are comparatively large, and that the net earnings as so shown during the earlier years will be found excessive when the

increased repair charges of the later years have to be taken into consideration.

In the case of a newly established enterprise this objection to the system is not likely to prove a serious one at first, as the variations in the repair charges are very likely to be balanced by corresponding charges in the gross earnings as the business becomes more firmly established.

If the physical depreciation of the property can be assumed to be on the straight line basis, one advantage of the straight line depreciation account will lie in the fact that the total theoretical plant value—the sum of the theoretical depreciated value of the plant and the total amount accumulated through the depreciation account—will always be equal to the total amount of capital originally invested. This advantage need really only be considered where the industry is such as to be subject to the posibility of arbitrary rate regulation.

In this country rate regulation is still in its infancy, and those to whom the questions connected with it have been submitted have unfortunately proceeded at times without due and careful consideration of all the principles involved. The result has been that no definite standard for the basis for the establishment of rates has as yet been agreed upon, and whether the capital originally invested, the depreciated value of the original plant, the cost to reproduce the plant under current conditions, or the cost to reproduce depreciated in accordance with the age and rendered service of the plant, shall constitute the foundation on which to base the rates promises to remain an open question for some time to come. There will therefore continue to appear cases in which the theoretical momentary value of a plant will receive undue attention in connection with the establishment of rates; and where the probability of such a state of affairs is apparent, the straight line depreciation account will probably continue in favor because of its tendency to keep the theoretical value uniform with the original capital investment.

SINKING FUND SYSTEM.

If the funds laid aside under a straight line depreciation cannot be invested so as to draw interest, it is evident that the total amount on hand at the end of the term will be more than sufficient to provide for the payment of the expenditures which it was designed to meet, and that the investment of a smaller sum during each period would have been sufficient to accumulate the required funds.

This sinking fund system, as it is called, involves the investment at a specified rate of interest of a periodic amount of such extent that the accumulated payments, with compound interest thereon, will be equal to the cost of the replacement at the time specified for the renewal, the place and manner of investing the funds being of course regulated with proper respect to safety and ease of liquidation at the specified time.

For small concerns, particularly those operating with large or comparatively large units, the sinking fund method is undoubtedly the most acceptable means of providing funds to cover the replacement of wornout plant, since it achieves the desired result with a comparatively small deduction to cover depreciation.

REINVESTED SINKING FUND SYSTEM.

Where the industry is of such a character as to permit of the procedure, the sinking fund may be carried on by the investment of the amounts involved in additions to the existing plant, instead of providing an outside trust fund. Under such a reinvested sinking fund system it is often possible to obtain a far better rate of return on the investment than can be secured from an outside source.

The amounts to be invested under this system will be governed partly by the computations of the amounts theoretically required and partly by the practical limitations ordered by the character of the plant units.

In calculating the amounts theoretically required, it must be remembered that the added plant units will depreciate in turn at the same rate as the original ones, and that the rate of interest to be returned by the plant purchased as a part of the sinking fund will have to be determined from the difference between its net earnings and the depreciation in its own value. For the proper compounding of the interest it will follow that the profit from this added plant will be devoted to the purchase of still more units as soon as its accumulations are sufficient to provide for their acquisition. With the higher rate of return obtainable under this system, the periodic payments into the depreciation fund will, of course, be even smaller than with the outside sinking fund.

It is sometimes claimed that any profit obtained over and above that which would be shown by a straight line account is illegitimate and illusory, but that point of view is due entirely to a narrow-minded consideration of a business or industry as a mere collection of plant units and not as a working whole of which the units in question are a part.

If we are to conduct a business in a business-like way, and to obtain from it the largest possible legitimate profit, we must regard it as a business and not as a mere museum of different kinds of plant units.

With some plants there is a constant possibility that the production of similar units of a new and more economical type will render the older type unprofitable for further use and therefore obsolete before the expiration of its useful life, and where such a possibility is seen to exist the establishment of a suitable fund to provide for these replacements is considered very good business.

The legal objection to an obsolescence fund is based on its lack of relation to any definitely ascertainable facts, but the purpose and possible requirements of such a fund are understood, and it is to be hoped that before long a suitable and reasonable provision of that character will be able to receive due and proper recognition. Such recognition will probably be more readily obtained if some standard arrangement for the disposal of the fund can be determined upon in the event that it be not required for the purpose for which it was designed.

The accumulation of the obsolescence fund can be arranged in the same general way as that of the fund to cover depreciation, except that the "life" will in this case be indefinite and entirely suppositious.

It will, therefore, be best to provide for a periodic payment as large as is compatible with suitable earnings on the investment, and to cease the payments when the fund has reached the predetermined amount. It may then be feasible to invest the accumulation and to regard the income so obtained in the light of a deferred profit.

It would not be wise, however, to attempt to invest such a fund in the kind of plant with which the business is being carried on, as the state of obsolescence may be reached comparatively suddenly and thereby render the fund practically valueless as well as the plant it was designed to protect.

Estimating the probability of obsolescence in a plant, or the possible date of obsolescence, is a rather difficult matter. In some lines of industry reference to the past may cast a very clear light on the possibilities of plant obsolescence in the future; in others it may be impossible to judge of anything beyond very vague possibilities.

In the production of standard articles or service, there is only the possibility of obsolescence in the plant

itself to be considered. Where special articles are produced, the plant may become obsolete through a cessation of the demand for the article, although the plant units may remain in good operating condition and economical of production. In the latter case, units of standard design and usable in the manufacture of standard articles could hardly be considered obsolete, and where such a possibility impended it would not be proper to provide for their replacement under obsolescence.

Where there is a fairly definite probability of a future cessation of the demand for the article produced, the best procedure would undoubtedly be to provide a suitable fund for the amortization of the entire capital invested, and to regard such return value as could be obtained from the partially obsolete plant as a deferred profit.

Any obsolescence fund, whether established to cover the temporary or permanent retirement of the plant, is really nothing more than an amortization fund for the capital invested in the plant to provide against the possibility of their becoming obsolete; and where any items are covered by such a fund, which must necessarily reach its full amount before the expiration of the normal useful life, no depreciation allowance can or should be provided, as the obsolescence fund will be sufficient to provide for the replacement of the units should they not become obsolete before they are worn out.

It has so far been assumed that the gradual reduction in the value of physical property due to depreciation will be uniform *i. e.*, that this depreciation is on the straight line basis. While this will occur only rarely and will be rather difficult to demonstrate even when it is the case, the true manner in which physical property actually does deteriorate is so variable and difficult of determination that the straight line basis will be the best to assume in practically every case.

Some authorities assume a certain percentage of depreciation, and apply it to the original value to determine the loss during the first period and to the depreciated value to determine the loss for any succeeding period. This method probably gives a fairly close approximation to the true lessening value in some particular cases, but in view of the fact that neither this system nor any other can show a value which can in any way be established as being absolutely accurate, it seems only to bring still further complications which might well be avoided into a situation already very complex.

That the straight line basis very rarely represents the true rate of depreciation is evident; but since the basis is bound to be one of opinion pure and simple, and since the purpose of bothering with depreciation at all is to equalize the periodic deductions to provide for it, the method that comes nearest to achieving the desired result and does so with the least complication ought to be considered the most acceptable.

Furthermore, the straight line basis, representing as a uniform variation the really unknown and indeterminate rate of change between the known first cost and the known scrap value, is most likely to meet with acceptance by the courts. For they are willing to accept the facts of the cost and the scrap selling price, but they are likely to regard with a questioning eye any special opinion as to a variable rate at which the change between the known values may be considered to take place.

These considerations of the legal point of view may possibly appear somewhat superfluous, but the constant possibility of litigation in connection with the operation of some industries and of official regulation in connection with others renders the legal point of view of their financial operations a most important consideration.

The distinction between what may be properly considered a depreciation account and other funds provided similarly but for different purposes is one which must not be overlooked, and caution must be observed to avoid the possible duplication which might ensue where different funds are maintained.

If an amortization fund were provided to pay off the capital invested in a plant it would be quite proper to maintain a suitable depreciation account to provide for the necessary plant renewals, as they became due, in addition to the amortization fund; but it is very doubtful whether, in the event of litigation, such duplicate deductions would both receive legal recognition.

In some instances it may be difficult to determine under just what heading a certain fund should be maintained. In a well regulated mining enterprise, for instance, some fund would probably be maintained to allow for the loss which would be represented by the abandonment of the property and plant on account of the exhaustion of the ore body. Such a fund might be regarded in the light of a provision covering the lessening value of the property, or as an amortization fund to provide for the repayment of the capital invested.

As the time of probable exhaustion is always indeterminate, the best procedure is to deduct the largest possible periodic amount for such a fund in order to be certain of completing the fund while production continues. The lack of definite relationship between the periodic payments and the true value and life of the property rather precludes the characterization of such a fund as a depreciation account.

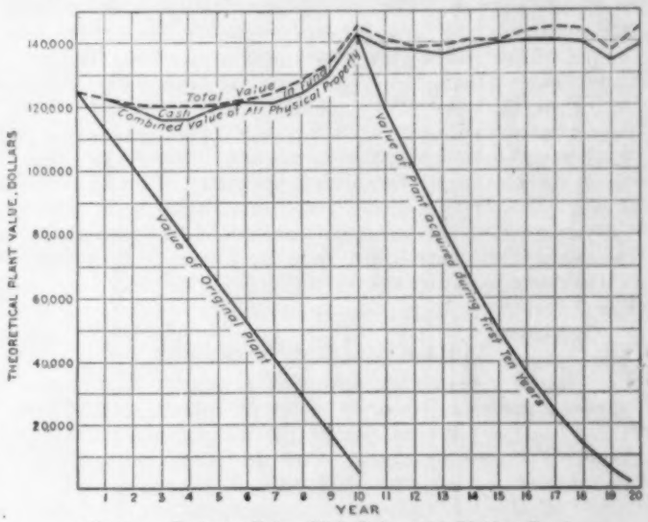


Chart 3. Property Value With Reinvested Sinking Fund.

On the other hand, it is quite as possible that the natural supply may endure longer than the plant with which operations were commenced. In that case, the portion of the amortization fund providing for the plant could properly be employed to replace it, and would, therefore, serve the purpose of a depreciation account fund.

It can be readily seen that the title to be applied to such funds and the accounts through which they shall be maintained is often a matter of opinion rather than of any definite rule; but if the purpose and the manner of providing a fund are made definite and clear, no complications need be feared because of the nomenclature adopted.

Various depreciation accounting systems purporting to be different in character from, and to possess advan-

tages over, the three general classes previously outlined will be encountered from time to time. Each will prove on analysis, however, to be nothing more than a modification or combination of one of more of the three classes mentioned, and will usually be found to provide results less beneficial than those which can be obtained with a standard system.

The most common of these is a crude form of the reinvested sinking fund which is referred to by its advocates as a straight line account. Since it involves the deduction for depreciation of an amount equal to that which would provide for a true straight line account, the name might at first appear just; but since the system involves the investment of these sums in additional plant, it really constitutes a reinvested sinking fund, except that the periodic deduction is excessive and there is an appreciable loss in profit during the time between the commencement of operation and the time when the periodic retirements and renewals reach a balance.

Another form, which cannot truly be called fallacious but which can rarely be applied with satisfactory results, is known as the diminishing value method. In this the periodic payment consists of a certain calculated percentage of the diminished value of the property. This method has the one advantage that the depreciation charges are much heavier in the earlier than in the later years of the life of the plant, and so serve to balance to some extent the gradually increasing repair charges.

The objection to the scheme lies in the fact that, with any reasonable degree of earning power involved, the earlier payments required are quite likely to be greater than the earnings; for with a ten year life assumed for a plant, the first payment would amount to approximately 20 per cent of the value, which would be more than the property could reasonably be expected to earn during the earlier years of its existence.

Japan and the Telephone

Japan recently celebrated the twenty-fifth anniversary of the establishment of the telephone in that country. In 1890 the first exchange was installed at Tatsunokuchi, although instruments were in use "from one ???? to another" as early as 1877.

On March 31, 1915, the total number of telephones in Japan aggregated 234,484, equivalent to 0.4 telephones per 100 population; at the same date the number of unfilled applications for service was 134,313, as against 132,757 on March, 31, 1914.

The *Journal of the Communication Association*, a monthly magazine published in Japan, devotes considerable space in its issues of November and December, 1915, to the development of the telephone in that country, with pictures of Mr. Carty, chief engineer of the American Telephone and Telegraph Company, and Dr. Alxander Graham Bell. The November issue reproduces Mr. Carty's message to Mr. Y. Riko, department of communication, Tokyo, sent after the first demonstration of wireless telephony from New York to San Francisco:

"Today I heard speech by our company's new wireless telephone from New York to San Francisco. I am sure of ultimate success in talking from New York to Tokyo."

And Mr. Riko's reply:

"Beg tender our sincere congratulations upon great achievement which your unceasing and never flinching researches into remote secrecy of science have attained. May you be crowned with further success."—*The Telephone Review.*

Interference Case in Minnesota

In arguments before Judge W. L. Comstock in the district court at Mankato, Minn., in the action brought some time ago by the Blue Earth Valley Telephone Company against the Commonwealth Utilities Company to restrain and enjoin the electric company from operating a certain transmission line which the electric company recently constructed from Winnebago southerly to Elmore, and into Iowa, the telephone company claimed that the currents from the power lines interfered with the operation of the telephone system and demanded that the power company pay several thousand dollars to make alterations in the telephone lines. The electric company claimed that the telephone lines were poorly constructed, with grounded circuits, and in bad state of repairs, but it was willing to pay a reasonable sum to assist in making alterations, but would not agree to the sum demanded by the telephone company.

The telephone company then got an injunction to restrain the electric company from transmitting current over the line. The electric company is supplying electricity to Elmore and the inhabitants of the village, and was about to turn current on for a number of other villages in northern Iowa.

Married by Long Distance Telphone

The distance of several hundred miles did not prove an obstacle for Cupid when Miss Elnora Beikman and Harry Stradley, both of Seymour, Ind., were united in marriage over a long distance telephone, with the bride at Seymour and the groom serving with Co. K on the Mexican border.

The wedding date had been set and as there was no prospect of Company K returning home they decided to be married by long distance telephone. The groom arranged to be at the telephone at Llano Grande with a lawyer as a witness, at the appointed time, and the ceremony at Seymour was witnessed by Attorney A. C. Branaman, Rev. E. H. Eggers, pastor of the German Lutheran church officiating.

The bride is a daughter of Mr. and Mrs. John C. Beikman, of Seymour, and the groom is a son of Mr. and Mrs. Frank Stradley, and was employed by the Public Service Company until the call came for the militia to leave.

Restore a Defunct System

Rehabilitation of the defunct Sound Telephone and Telegraph Company, operating telephone lines between the mainland and the islands east of Tacoma, Wash., is the object of A. and M. Ohlson of Tacoma and W. J. King of Lake Bay, who filed articles of incorporation for the company at Olympia. The capitalization of the new corporation is $10,000.

The telephone line connects Joe's Bay, Vaughn, Lake Bay and numerous other communities with the mainland south of Tacoma.

Minnesota Bell Fights Connection

One hundred and eighty-five printed pages contain the brief submitted by the attorneys for the Northwestern Telephone Exchange Company, in the matter of the application of the city of Owatonna, Minn., to have physical connection established between the local toll lines of the Northwestern Telephone Exchange Company, and those of the Tri-State Telephone and Telegraph Company.

Pioneers in Annual Convention

Society of Early Telephone Workers Meets in Georgia

DR. THOMAS D. LOCKWOOD, post office address Boston, general patent attorney of the American Telephone and Telegraph Company, holder of more degrees than any other man, woman or child in the telephone business, and a would-be astronomer, if he had the time to study the subject and wasn't afraid it might ruin his eyesight, was in the chair at the opening session of the Telephone Pioneers of America, held in the convention hall of the Piedmont hotel, at Atlanta, Ga., Friday morning, October 27.

He was promulgating the suggestion that somebody move to dispense with the reading of the minutes. Catching the general trend of Dr. Lockwood's meaning, several of the members simultaneously arose and moved to dispense with the reading of the minutes, which motion was duly seconded, submitted and carried.

And that was about all, so far as routine business was concerned. For the Telephone Pioneers of America don't assemble for business. Once a year they get together in some big city and have a good time. That being the purpose of their annual convention, that's the program they follow. They hew right to the line and let the chips fall where they may.

Mayor James G. Woodward extended them a welcome in behalf of the city, told them to go as far as they liked, and expressed the hope that they'd carry away a pleasant impression of our fair city.

J. Epps Brown, vice-president of the Southern Bell Telephone Company, did the welcome honors for Colonel W. T. Gentry, president of the company, who was barely able to leave his bed Friday morning after a two weeks' spell of the grippe, and who had orders from his doctor not to talk.

"I am delegated by Colonel Gentry and the mayor," said Mr. Brown, "to authorize and invite you to take anything you see that strikes your fancy. Barring only one thing. Fred Houser, the genial and inimitable secretary of our convention bureau, has no equal in captivity. We need him, could not replace him if you took him, and hence we respectfully ask you to use him all you want to but leave him when you go."

When they arrived at the Terminal station five hours late Thursday night, after being tied up in the middle of a swamp on the northern rim of Atlanta by a freight engine that got crossways of the track in front of them, they found Fred Houser playing "Many, Many Stars" with some six or seven dozen good-looking telephone operators in the main waiting room of the station.

There were six hundred girls at the start of the festivities, which commenced at 5 o'clock in the afternoon, but all of them couldn't wait for the wrecking crew to move that freight engine off the track. If they had, somebody certainly would have failed to get an answer from "Central" Thursday evening.

But Fred Houser and his faithful six dozen stuck it out, and were right on the job with the big league welcome business when the Pioneers at last arrived.

And Friday morning, after a good night's rest and fresh linen and hearty breakfasts, the Pioneers came swarming into the Piedmont lobby and began their annual frolic, finding the Southern Bell Telephone Company ready and waiting from Colonel Gentry on down, to show them a good time.

"Never saw so many automobiles for delegates to a convention," remarked a Pioneer who has attended all the annual conclaves ever held, and attended many others of various kinds. "You can't turn around for stepping on 'em."

Theodore N. Vail, president of the American Telephone and Telegraph Company, and president of the Telephone Pioneers of America, was prevented from attending the convention, and so was Dr. Alexander Graham Bell, inventor of the telephone, who was scheduled to be there.

But there were notables enough to go around and still have a few left over for good measure, and they enjoyed themselves to the utmost in the warm southern sunshine. A couple of Pioneers blossomed out in white flannel trousers and white shoes, and found them quite in keeping with the weather. Three hundred of them in all, were registered for the convention, and the Southern Bell officials and employes made it the most enjoyable convention they ever attended.

Following the business session Friday morning the Pioneers proceeded to make themselves perfectly at home, after which they lunched in various places, and in the afternoon held a session for the reading of papers.

At 1 o'clock the ladies in attendance were given a luncheon at the Piedmont Driving club by Mrs. W. T. Gentry and wives of other officials of the Southern Bell, and Colonel Gentry entertained some twenty-five or more of the notables at an informal luncheon at the Capital City club.

The Telephone Pioneers of America on Friday elected the following officers for the ensuing year:

President—Theodore N. Vail.

Vice-Presidents—Thomas D. Lockwood, Edgar F. Sherwood, James T. Moran, Ben S. Read.

Treasurer—George D. Milne.

Executive Committee—Frank A. Pickernell, Richard T. McComas, Albert Lincoln Salt, James Robb, Charles H. Wilson.

A bale of cotton was rolled on a truck into the dining room of the Piedmont hotel Friday night and presented with impressive ceremonies to Dr. Thomas D. Lockwood, who was presiding over the banquet which the Pioneers were enjoying.

Forrest Adair, of Atlanta, "than whom there is none whomer," as Samuel G. Blythe would say, when it comes to post-prandial oratory and presentation speeches, tendered the bale of cotton to Dr. Lockwood with some very eloquent remarks concerning the present importance of the south's fleecy staple in the world of finance, high explosives, 20-cent sell orders and British interference with neutral trade.

Dr. Lockwood was taken aback, to say the least. He regarded the bale of cotton as a highly appropriate gift for a banquet given in Dixie, and his heart was warmed by the sentiments expressed by Forrest Adair, but he naturally wondered how he was going to get his present home.

Brief was the doctor's apprehension. The bale of cotton opened like a wardrobe trunk and out of it stepped a damsel who dazzled the eye, who bewildered

the doctor with her smiles, and who regaled the diners with a delightful song.

And thus the banquet ran its merry course, a continuous round of jokes and jests and speeches and songs and stunts that took one's breath away.

Set speeches were delivered by N. T. Guernsey, general counsel of the American Telephone and Telegraph Company; C. Murphy Candler, chairman of the Georgia railroad commission; F. H. Bethell, president of the eastern group of Bell telephone companies; L. B. McFarlane, president of the Canadian group of Bell companies, and Clark Howell, editor of the Atlanta *Constitution*.

The latter presented to the Pioneers a beautiful de luxe edition of Uncle Remus printed as souvenirs for the occasion by the Southern Bell Telephone Company. An associate of the late Joel Chandler Harris for many years, Mr. Howell told the Pioneers a number of stories illustrating his lovely character.

Another handsome souvenir was presented by the American Telephone and Telegraph Company, a bronze medallion made from the first copper wire used on the first long distance telephone circuit in America, which ran from New York to Boston. On the face of the medallion was an account of the history of the line, and on the reverse a bas relief of a lineman repairing a telephone line in a sleet storm.

And outside of the set speeches and set presents there were innumerable other stunts and gems of eloquence, not forgetting to mention Fred Houser's song fest, which made the same delightful hit with the Telephone Pioneers that it always makes on every occasion where Mr. Houser introduces his "convention song book" of old-time popular songs.

The banquet Friday night wound up a day of fun and frolic for the Pioneers, among the events of the day being a luncheon at the Driving club for the ladies by Mrs. W. T. Gentry; an informal luncheon at the Capital City club by Colonel W. T. Gentry; a luncheon by the Rotary club for Rotarian-Pioneers; an automobile ride over the city, etc.

Saturday at 1 o'clock the Pioneers were introduced to an old-fashioned Georgia barbecue at the Druid Hills Club as guests of the Southern Bell Telephone Company, and Saturday afternoon the annual convention of the Pioneers came to a close.

Lima, Ohio, Rejects Municipal Ownership

Electors of the city of Lima, O., showed no hesitation in the manner in which they turned down the proposal submitted by socialist leaders for municipal ownership of the telephone plant. An overwhelming majority was piled up against the plan of taking over the plant. Voters numbering 2,342 were in favor of the proposal and 5,108 opposed it.

Officials of the telephone company are pleased with the result of the vote, feeling that the people are appreciative of the excellent service afforded. The result of the vote is an indication that the citizens of Lima are not anxious to endanger the present good service by placing the plant in the hands of the city.

Ohio State Operators Get Lunch

The Ohio State Telephone Company's operators in Cleveland can now gather in their newly built dining room in the Electric building and enjoy a home-cooked lunch of bread at 1 cent, meat at 5 cents, tea or coffee at 2 cents, real flaky crusted, well filled pies at 4 cents a quarter cut; a wholesome, complete noon meal for 9 cents to 15 cents. Two hundred and twenty-two meals were served the third day, at an average price of 14 cents a meal.

Newspapers Telephone Election News

Much as the telephone is valued by everybody and enormous as is its potential utility, that perhaps most wonderful invention of the nineteenth century is not yet old enough to have produced a sufficiently widespread recognition of its intrinsic limitations, especially in newspaper offices. This leads to occasional misuses and excessive demands, the result of which is failure to secure all the advantages that would follow if every resort to this precious form of communication were at once wise and considerate, says the New York *Times*.

These reflections are prompted by the fact that the present election has been one of the times when the telephone, besides creating precious, almost priceless, facilities for the newspapers, has also caused not a little inconvenience to them—so much of it, indeed, that it has been found necessary in many offices to emphasize, by the adoption of new rules in regard to the answering of inquiries, the fact that the first task and duty of a newspaper is to send out information in printed form. Nothing, obviously, can be allowed seriously to interfere with the accomplishment of that purpose, and there has been much of such interference in the last two days because a great number of people have "called up" what ever happened to be their favorite paper and asked for election news.

Their desire for information is legitimate and even commendable, and there is in every office an inclination to satisfy it whenever the possibility to do so exists. So numerous have these inquiries been, however, that they have overwhelmed the newspaper wires, to the frequent preventing of their use for the collecting of news through the established channels as well as to the taking up of the time of the office staff to an intolerable extent. The consequence has been a forced withdrawal, for the present, of a privilege the exercise of which by the public would tend both to delay the issuing of the paper and to make its contents inferior to what they would otherwise be.

Hastings, Mich. to have Automatic

Officers of the Citizens Telephone Company of Grand Rapids, Mich., have made complete arrangements for installing an automatic telephone service in Hastings. The company proved in a hearing before the state railroad commission that its exchange in Hastings was not a paying investment. A proposition for installing a new service at reasonable advance in rates was accepted by citizens. The corporation's additional investment there will be $40,000. The new exchange will be opened in the Mulholland block.

Wireless Telephone for Illinois Sanitary Board

A wireless telephone system will be established between the power plant at Lockport, Ill., and the distributing station of the sanitary district at Western avenue and Thirty-first street, Chicago. An order authorizing its installation at a cost not to exceed $4,000 was passed at a meeting of the drainage board. A wireless telephone is needed because of its unimpaired service during storms.

Governmental Regulation

Address Before the Texas Local Owners Telephone Association, Fort Worth, October 25

BY A. C. STUART

REGULATION of public utilities on the part of the National Government, the states and municipalities has passed through the preliminary stage of controversy as to whether or not the principle in itself is correct and legal. Except that as far as the state of Texas is concerned, many of the brightest members of the bar doubt whether or no a public service commission instituted by the state would be legally constituted in the absence of an amendment to the constitution. It will be remembered that when the railroad commission of Texas was established by legal enactment, the constitution of the state was first amended and the proposition favorably voted upon by the people. It is contended by many that this must be done in advance of the institution of a public utilities commission. However, that the desirability of a public utilities commission may be discussed by the members of the Local Owners Telephone Association, this point will not be considered and it will be taken for granted that if the people of Texas desire a public utilities commission the Legislature will either provide for it by statute or vote in advance an amendment to the constitution, to be submitted to the people for ratification.

With this point out of the way and standing upon the basis that a public utilities commission could be constituted, the proposition then assumes the position where it may be discussed along the line of the necessity of such a body, its scope, its powers, and the results, good or bad, that would come about through its having charge of the public service corporations doing business in this state—not alone as to how its workings would affect the owners of the properties, but also their patrons and the public at large.

It must be conceded at the outset that if a considerable majority of the patrons of the public utilities of Texas, or the body politic itself, desires a public utilities commission, this should be done, for the will of the people is supreme. The argument, pro and con, by the members of the legislature, as well as the public at large, will, therefore, be waged upon the necessity of such a commission, as well as the wishes of the people relative thereto. I think it can truthfully be said if we should reach the conclusion that a commission would prove detrimental to our interests, at this time there is no necessity for its creation nor do the people desire that it be created. There is nothing like a general complaint as to the public utilities operating in the state of Texas on the part of the public, either as to the rates charged for service or the character of the service rendered. There is no well defined demand on the part of the people for such legislation. The mass of the people of Texas are not complaining. The vast majority of our citizens are seeking the greater development of the state by the public utilities at this time rather than the hampering of them by any possible harm that may come through legislation. It is true that certain interests are displeased with telephone companies on account of the concessions that were made by the Southwestern Telegraph and Telephone Company in times gone by and which were withdrawn about two years ago. This displeasure, however, is confined to those who are well known to be most prosperous and who least of all should complain of the withdrawal of concessions that were made in error and were in justice cancelled, especially as the additional charges to them were given back in a reduction of rates to the smaller users. Their attacks upon telephone companies cannot have weight and have been unsuccessful in the past and will probably be so in the future. It should also be borne in mind that all public utility corporations doing a local business are at the present time under the power of the municipality in which the business is conducted. The business done outside of municipalities by public service corporations, excepting telephone companies, amounts to but little and, therefore, does not call for government regulation.

The meat of the question that is before us is as to whether or no we, as telephone owners, should favor a public utilities commission, and I propose to sum up the advantages as I see them.

From the fact that the city governments have at the present time the right to regulate local business, I fail to see where there is one single possible advantage to us in such a commission being created, unless it be to arbitrate any disputes that may arise between us or other telephone companies. Considering the fact that we are getting along harmoniously among ourselves and with all other telephone interests as far as I am aware, believe that even in this respect a public service commission would not be advantageous, for its handling of our affairs along these lines might cause us to work less harmoniously with one another than at the present time. Under present conditions, we, having the feeling that we must deal fairly with one another, upon our own initiative, have gotten along with practically no friction.

As you all know, the Interstate Commerce Commission has jurisdiction over those of us who, in any way, either in handling our own business or in connection with other companies, do an interstate business. It is true, the Interstate Commerce Commission has not as yet sought authority over the smaller companies, but that commission is gradually extending the scope of its activities, and it is but a question of time when every company will come under its supervision. Governing bodies of incorporated towns have authority over our local business. It cannot be thought for a moment that this authority will be cancelled. The creation of a public utilities commission will bring a third governing body into play that has authority over the business of most of us. Therefore, we will have the federal commission, the local city governments and the state commission all dictating to us, laying down regulations as to the conduct of our affairs. We are liable to face investigations, disagreements over even litigation with any or all of them and be ground up in the expense involved therein. If ever any of us fall out with the federal commission and are forced into litigation and are compelled to carry on this litigation through the federal courts, this will prove so expensive that we cannot foresee how disaster will be averted. Of course, we hope that such an unfortunate condition of affairs will not arise. Misunderstandings with our local city governments we, of course, hope to avoid, but if we are forced into the courts, the expense will not be so heavy as in having litigation away from our own home towns. A state commission would undoubtedly sit at Austin, the capital, and whenever complaints arise as to

our treatment of the public, the character of the service we render, or the charges we exact therefor, it will be necessary that we go before this tribunal. This will mean that we must travel to and from Austin, with our accountants, our engineers and our attorneys. Such a prospect is not an inviting one. Any of our subscribers, even if disgruntled through an unjust cause, could cause us endless trouble and expense.

Again, we will face very expensive bookkeeping. Many of us at the present time keep our books according to the rulings of the federal commission. The city government may demand a different method of bookkeeping, and the state commission still another. It is impossible to forecast where such expenses will begin and end. They should certainly be avoided if possible. Certain standards of construction are liable to be set up by any or all of these commissions at any time, and even the purchase of supplies and the amount involved will come under regulation. State public utilities commissions over the country are going this far at the present time.

A state public utilities commission would doubtless dictate as to the construction of your long distance lines, the character of poles, and the number of circuits you must place upon them. In short, you would find yourself dictated to in every possible shape and manner. Between all the commissions that would have supervision over you, you would hardly be able to turn to the right or left without someone's authority. Such conditions, it seems to me, should be avoided if possible and there is but one way to avoid them. We must exercise the utmost diligence to please the public; we must give good service; we must exact but reasonable rates, and above all, in our dealings we must be fair and courteous. It goes without saying that only by carrying on our business upon fair methods can we please the public, and it further is a fact that only by the exercise of courtesy at all times, both by ourselves and our employes, can we have the good will of the public. I think we all recognize this and are doing well along these lines, but let us resolve to do even better.

If you agree with me in my conclusions, there is but one more thing that you can do; that is, energetically lend your efforts toward opposition to the creation of a state public utilities commission in Texas. There are so many of us that that which is nobody's business in particular is neglected—it is thought the other fellow will attend to it. We must overcome this tendency. Each and every one of us must realize our individual responsibility. If every local telephone owner in the state of Texas would individually take it upon himself, when the opportunity affords, to express his opposition to a state commission regulating his business, to his senator or representative, and give his reasons, unquestionably no law will be passed at the next session of the legislature creating such a commission.

Remembering Telephone Numbers

Telephone operators and users have discovered that it is easier to remember a number of four figures if it is cut in two. Instead of reeling off the four figures at once, give two, pause slightly and then give two more. It is surprising how the little device helps the memory. Another variation of the same trick is to express the number in the form of dollars and cents. A man is told to call B-1927. "All right," he says, "nineteen dollars and twenty-seven cents."

Buffalo Public Approves Merger

Inasmuch as Buffalo, New York, has approved the merger of the New York and Federal Telephone companies by a majority of 4,279, the companies are now free to work out the consolidation plans as submitted some time ago. In the face of the large vote on the question of either upholding the action of the Council or turning it down, it was stated that opponents to the merger will abide with the result.

The two companies are now in a position to apply to the Public Service Commission for an order permitting the actual consummation of the merger plans. The commission will also decide the question of rates.

Under the terms of the contract between the two companies the investors in the stocks and bonds of the Federal company are to be paid the value of their holdings so they will practically sustain no loss.

Notwithstanding the voters approved the action of the council in granting permission for the merger of the Bell and Federal companies, it will be many months before the actual consolidation is effected.

No one has a clear idea of just how much time may elapse before the actual merger will have been accomplished. There are two reasons for this uncertainty. To begin with, the task of physically unifying the two systems—joining them together in a single, comprehensive, smoothly-working system—will be a delicate, tedious task, requiring considerable time in its performance. Another is the difficulty in procuring special materials required to work out the physical consolidation. This difficulty is due to the fact that orders placed for metal in any form cannot be filled for a long time.

Officials of the Federal Telephone Company already have submitted to the department of justice at Washington all the facts in relation to the proposed merger, with a request that the department sanction the plan. This request was made necessary because the Bell telephone system of the country promised the department of justice it would not attempt to absorb any more independent companies without the consent of the department.

The department of justice also has been advised of the large majority by which the merger plan was approved at the recent referendum election.

Just as soon as the consent of the department is obtained the work of merging the properties will be gotten under way.

The Bell and Federal companies, Mr. Spaulding said, are preparing immediately to circulate petitions in Batavia, Lockport and other surrounding towns with the idea of effecting a merger.

"We propose to follow in all these smaller towns precisely the same policy we followed here," said Mr. Spaulding. "That is, we intend to take the people into our confidence, lay all our cards on the table and let them decide. That course was followed in Buffalo, and we have concluded it is a pretty good thing to take the people into your confidence."

The Western Electric Company is about ready to begin the construction of a building to have 300,000 square feet of floor space. The building will be an addition to the telephone shop at Hawthorne. It will cost $700,000 and is to be ready for use by the company on July 1. The company now has sixty-eight buildings at Hawthorne.

Development Costs

An Important But Elusive Factor in the Determination of Equitable Rates

BY ARTHUR CHESTER

IN determining equitable rates for public utilities the one factor which probably causes more speculation than any other is "What did it cost to develop the business?" It may be safely said that a public utility does not yield a profit on the investment the first year of its history. What year of its life does it begin to yield a profit and how much was lost up to that time?

The early financial history of many telephone properties was not recorded in very definite form and appraisers of those properties today are confronted with a puzzling problem. How shall they arrive at the cost of development?

Let us assume that a perfect system has been built with sufficient distribution facilities for 10,000 subscribers; that a switchboard and other central office equipment has been installed and that the cost of this work is definitely known as is the cost of installing each telephone. The company might have 10,000 telephones ready to install, but without the subscribers it could do no business. Suppose a solicitor undertook to get subscribers and the first party he approached said "Your plan sounds good, but how many subscribers have you? I can not afford to be the only subscriber. Get some other subscribers first." Then assume that everyone approached thereafter said the same. There could be no system. Some inducement must be offered the pioneers.

Usually the inducement is in the form of an agreement not to charge for service until a definite number of investments has been connected. Sometimes a graded scale is adopted thereafter until the published rates are reached.

Very few telephone companies have definite information as to how many contracts were signed to secure their present business. They do not know the total number of subscribers they have served since they began operation.

H. B. Crandell has suggested a theory of determining costs in an appraisal recently filed with the Illinois State Public Utilities Commission which is unique to say the least. In brief his theory is that to secure a given number of bona fide subscribers, say for instance 1,500, the company really wrote a total of 3,000 contracts, one-half of which were canceled or expired by reason of the subscriber leaving the city, moving and not renewing service, death and other causes. Of the 1,500 contracts which were written but which were not visible on the books of the company at the time of making an appraisal, 750 are assumed to have been a dead loss; that is, the instrument was removed and the drop taken down. The other 750 are assumed to have been contracted for a second time without the removal of the drop or instrument between contracts.

In many cases the small telephone company does not know the cost of securing a contract. Loyal employees and often the directors of the company bring in new subscribers. Irrespective of how the business was brought in, energy was expended in securing it and the fact that this energy was gained by the company at a low cost is merely comparable to an unusually good buy in apparatus or materials by the company. If the company could purchase an instrument in 75 per cent good condition at 50 per cent of a 100 per cent instrument, it would probably get a 75 per cent condition by an appraiser irrespective of the purchase price. Therefore every contract may be considered as having a money value.

In the above case of a company having 1,500 subscribers, assuming that each contract represents a cost of $1.50 and assuming that it cost $1.50 per station for wiring and $2.00 for removing the drop the cost of development might be estimated as follows:

Cost of securing 3,000 contracts at $1.50	$ 4,500.00
Cost of removing 2,250 drops at $2.00	4,500.00
Cost of wiring 1,500 houses at $1.50	2,250.00
Total cost of securing 1,500 present subscribers	$13,250.00

The figures used are assumed in all cases and the proportion of contracts which were not renewed is estimated. The plan is of particular interest because it proposes to determine the cost of development on a price per contract written. Should the commission admit that this plan is equitable, the cost of developing a telephone business should be comparatively easy to figure.

The writer was fortunate in securing figures of the number of contracts a company wrote during twelve years of its existence, and these tend to bear out the theory to some extent. They at least show that a great many more contracts were written than the company had subscribers at the time of making appraisals.

During this time the company wrote a total of 11,995 "In" contracts orders, 9,255 "Out" orders, to get a net gain of 2,740 bona fide subscribers.

The "Out" orders may be roughly classified as follows: Non-payment, 653; can't afford, 451; left city, 1,322; moved and did not resubscribe, 895; quit business, 393; don't need telephone, 1,706; poor service, 46; change in rate or record, 1,849; refused to pay increase in rate, 170; want long distance service, 12; taken out account strike, 13; moved and resubscribed, 1,573; temporarily disconnected, 362.

In addition to the above development costs the same appraiser in the same case has added an item which he calls "Earned Increment," this being a charge of $4.00 per telephone.

The argument for this item is that the territory covered by the company is almost completely developed, showing a ratio of about 15 per cent. All public utilities and modern conveniences which have been built in the community have increased the value of the property from 10 to 50 per cent. This increase in value being over and above the tangible improvements added to the property. The contention is that since the public utilities were built and caused this increase in the value of the property they should derive some of the profit brought by this increase.

The contention is novel and will probably cause some comment, whether recognized by the commission or not.

The following notice was once sent out by the steward of the Cleveland Roadside Club:

Since the recent storm our Bell telephone is out of service. Will members please use our Cuyahoga phone, calling Princeton 969?

Later—The Bell telephone service has been restored.

How the Meters Work

Regarding the claim of the Washington (D. C.) Citizens' Association that there existed no definite system of metering calls, officials of the Chesapeake and Potomac Telephone Company invited a representative to inspect the system which is employed for this purpose. This system is largely automatic.

Each subscriber has his own meter dial in the exchange, which works automatically, but which cannot be moved forward unless worked by an individual circuit between the subscriber's own telephone wires and his meter. The key which the operator presses to complete this circuit is the same for all subscribers on her board, but only works in completing the particular circuit indicated by the pilot lights.

At midnight on the last day of the month each of these individual meters in the meter room is read. The total which showed at the end of the month previous being subtracted from the final total as shown indicates the number of calls made during the current month.

There is, of course, possibility of human error in the reading of these meters, just as it is possible for the reader of one's gas or electric meter to make a mistake. As no permanent record is kept on the meters of the monthly readings, the telephone company takes into account the possibility of errors in the readings, and, when complaint is made, an adjustment is made on the basis of the average bills which the subscriber has paid.

The New York Telephone Company has met this possibility of error by a unique device. This device was adopted principally to overcome the difficulty of reading all of the thousands of tiny meters promptly at midnight on the last day of the month, so as not to include calls registered after midnight. A special flashlight camera was devised which at one snap made a distinct picture of all the meter totals. The meter readers were thus enabled to make out the bill of each subscriber more leisurely and carefully. Moreover, the system of taking these photographs gives the company an indisputable record to refer back to when complaints of overcharge are received.

Illinois Court Settles Inter-State Company

The recent decision of the Illinois supreme court granting permission to the American Telegraph and Telephone Company to purchase the remainder of the stock and bonds of the Inter-State Telephone Company, means the majority of the telephone systems in the state soon will be owned and operated by one corporation.

Before the decision of the court was handed down the Bell concern owned 60 per cent of the Inter-State stock. When the former company sought to purchase the remaining stock, Edward Romberg, a stockholder of the Inter-State Company, protested and started proceedings in the Sangamon county circuit court. The court upheld the decision of the state public utilities commission approving the sale of the remaining stock.

Romberg appealed to the supreme court on the grounds created a monopoly in the telephone business. The supreme court dismissed the appeal. The Inter-State system runs north into Wisconsin and west to the Mississippi river with hundreds of miles of branch lines.

Telephone officials stated the Bell concern would start operation of the Inter-State lines as soon as arrangements could be completed for physical connection with the same. The completion of these arrangements probably will take at least a year.

Austin, Texas, Has Merger Ordinance

A telephone merger and franchise ordinance, acceptable to both the city and the Southwestern Telegraph and Telephone Company, was passed November 16 by the city council of Austin, Tex. It will be submitted to a vote of the citizens of Austin on January 4. The question of a telephone merger has been before the city council over six months. J. E. Farnsworth of Dallas, vice president of the Southwestern Telephone Company, who was present at the time of the passage of the ordinance, said the ordinance is the best of its kind in Texas, considered from the standpoint of the public interest, and in his opinion there is no more progressive ordinance in the entire United States.

Among the many features of the ordinance are: Requirement that the telephone company shall put an average of 2,000 feet of overhead construction underground each year; at the end of ten years, or at the end of any subsequent five-year period, the city has the option of taking over the company's properties at their capitalized value or defined in the ordinance; the company pays the city a gross receipts tax of 1½ per cent and an annual bonus of $1,250 additional; long distance rates to be the same as elsewhere in the state; company is to erect a new building to cost $75,000, with modern equipment; operators' wages to be increased 10 per cent; the company will be allowed to charge $5 for business phones, other rates not to be changed; the franchise is granted for twenty-five years; rural lines in Travis county will be given connection with the exchange without additional charge; company required to spend $300,000 in addition to the sum paid for the properties of the Independent company; the company cannot ask for an increase in rates until after five years; the city can demand a decrease in rates at any time; 25 per cent of the voters can at any time bring about an investigation looking towards a decrease of rates; the company is forever stopped from questioning the right of the city to fix rates for service under the methods provided in the ordinance.

There are many persons in Austin, Texas, who would pay $24 to $48 a month rather than do without a telephone.

This fact is brought out by the number of homes and business places having the Texas or new telephone installed to take the place of the Southwestern telephone, which was out of commission on account of the Kreisle building fire. Since this telephone company seldom accepts a contract for less than a year and never for less than six months, it is evident that those who are installing the new telephone are willing to pay for it for a year or six months in order to get the use of it during the month required to repair the switchboard of the Southwestern plant.

Between twelve and twenty-five new telephones are being installed every day, according to R. S. Shelley, manager of the local Texas telephone plant. "The sudden destruction of the Southwestern plant placed us in a predicament," he says. "We were immediately forced to double the number of operators, and even this force has a pretty busy time of it in the morning when the orders for meats, produce and groceries are going in from many homes in the city. One woman in the university neighborhood tells me that the 'bread line' in front of her telephone has worn out the new carpet on her hall floor."

Preliminary and Indirect Costs

Read Before the West Virginia Utilities Association

BY F. B. H. PAINE

AN expense or sacrifice of money or time is involved in every activity undertaken by man, whatever its nature and be it large or small; and no matter how small or simple the activity may be there are certain parts of the expense which may be attributed directly to the particular activity, and there are other parts of the expense which are common to that particular activity and to other activities sometimes, but not necessarily, related to the particular one under consideration. This fundamental proposition is so obvious when it is simply stated that at first glance there seems litle justification for its discussion.

Proper cost accounting will not rest with only the part of the expense which may be directly attributed to the particular activity; proper cost accounting will concern itself with all costs, including that part of the expense which is common to various functions and activities, including the particular activity to which its proper share of the common expense should be apportioned, and which is sometimes of greater monetary value than the part of the expense directly attributed to the particular activity.

Let us refer to the part of the expense directly attributed to the particular activity as the *Direct Costs* and to the part common to several related or unrelated functions or activities and apportioned between them as *Indirect Costs*. The exact terminology does not matter—I employ these expressions because they are short and fairly self-explanatory; other expressions would be as good possibly. I avoid the use of the word "overhead" because as it is used it has come to mean one thing here and something else there; sometimes a *cost* is referred to and sometimes some other element of *value* is meant.

The reason for the discussion must be that the simple proposition has become complicated with the complication of functions, duties, activities, etc. To many who have not personally had the opportunity of viewing any problem or enterprise in its entirety, the importance and magnitude of the indirect costs are minimized and some items are often omitted entirely from consideration when the investigator has not had to do with and may not even be aware of the existence of the omitted items. Some of these investigators just referred to who have the subject to deal with are so placed that their misunderstanding or lack of appreciation of the magnitude of the problem results disastrously to others.

The root of the trouble lies in imperfect accounting. Accounting as an art or a science is like everything else, in a developmental stage. It is in very bad shape; is now much improved though far from enabling us even now to express all the facts in sufficient detail; and the future holds great opportunity for those who advance the accounting art. There is not a standard system of accounts today that is satisfactory to anyone, its designer or its user, perhaps because accountants have rarely recognized the necessity for a thorough understanding of the business involved and because those for whose guidance accounts are kept so rarely understand bookkeeping or are able intelligently to interpret "the books," and often look upon the whole matter as a pernicious nuisance; the latter are those who prefer "jack knife methods."

We have not set down in our accounts the necessary detail data from which the actual detail indirect costs can be ascertained as of the past; and there are few if any of us setting them down today in that detailed, analytical manner which establish their magnitude and nature as of present experience. We are most of us wrong in thinking that the cost of so doing and the trouble of it is not justified under the press of economy and urgency of what, at any given moment, seems of more importance.

Direct Costs are those expenditures which are directly attributed to and charged to a particular job, and with few possible exceptions, such, for instance, as liability insurance, *all* items of expenditure made solely for a particular job should be so charged in cost accounting; labor and material can be so dealt with, including the job foreman, and it does not matter whether we are "constructing" or "operating." From such data *Unit Costs* may be developed whether for operation or construction accounts, and there rarely is and never should be serious difference of opinion over the direct costs.

Indirect Costs are those in which any given expenditure is made in the interest of more than one job or function, as, for instance, a general foreman looks after several jobs; or more than one function is involved as the general foreman who may oversee both a construction job and operating job at the same time. Proper accounting will provide for apportionment of such an indirect cost to the various jobs of functions affected; the former is capital charge and the latter an operating charge. The problem of indirect cost determination then becomes one of properly accounting for all expense and apportioning properly its share of the various indirect costs to each job or function. To so apportion an item of indirect cost among the various jobs and functions as will fairly distribute or apportion a general charge to whom and what it is rightfully due, should be the duty of those only who have a thorough knowledge of the subject dealt with, based on experience, and the final authority should have had experience in work of many kinds.

It is here, I believe, that our standard accounting systems and the accompanying instruction fail, for they usually provide only a miscellaneous group of accounts in generalities and without such detail of items or detail instruction as will provide for systematic complete intelligent distribution of indirect expenditures of time and money. If we chose to do so, we can, through our own sub-accounts, go into any amount of detail, but the trouble with this is that we thus get only individual judgment and experience. This does not permit the most useful comparisons. Perhaps an extreme illustration will be found in the following experience; I have recently had occasion to compare the cost of service connections as made by two utilities of the same type in different cities. The work was done under the same specifications with the same material costs; labor in one differed very little from the other, about 50 cents a connection. The cost accounting was made under the same system of accounts and same general instruction, but the major part of the expense involved had to be apportioned, and this part was left to the judgment of individuals. The result was that the

apparent cost of one was $15 and the other $20 (approximate amounts). An analysis showed conclusively that the difference was due to two causes—the omission of certain indirect cost items in one which was included in the other, and a difference in the detail scheme of apportionment. The costs were actually as like as two peas in a pod; in the lower case some other activity or function was as much over-charged as the service connection was under-charged.

Although I have so criticized the several hundred so-called standard systems of accounts for the imperfections which make them so inefficient when used by relatively inexperienced men, and result in misunderstandings, yet as these accounting systems now are, if they are properly kept they do supply the essential basic data upon which reasonably fair judgments can be based. When dealing with old properties, the determination of the indirect costs involved must largely consist of estimates based upon comparatively recent broad general experience; judgment (with all the word implies) becomes requisite, as it also does when estimating for future properties or additions if present local experience is absent in any case or for any details.

The personal equation also has to be considered. I have in mind a large utility corporation rendering public service whose growth and expenditures for capital account much exceeded its operating expenditures, yet not a cent of the salary and expenses of its chairman of the board, president, treasurer and board of directors, etc., was apportioned to capital expense. In response to a question I was told that to do so was not thought *"dignified!"*

It is not always easy or simple to make proper apportionments. We shall make a great step forward if we succeed in eliminating the unfortunately prevalent idea that these indirect costs, or overheads, call them what we please, are indefinite, intangible, not real, or such as the prestidigitator reaches into space for and picks out of nothing as he appears to become possessed of rabbits and oranges and even lemons.

We are not talking about indefinite values arising from various theories or practices. We are discussing true costs, costs as true as those involved in the payment for a pole, conduit, or a section of switchboard; costs as essential to the building or operation of a utility as are those items. Sometimes our accounts indicate some of the items and other items are merged in general terms or overlooked. All of those costs which we are now discussing represent expenditures necessarily made and necessarily apportioned equitably to various functions or jobs involved in constructing and operating any kind of property; they are indirect, although very real and as essential to the construction and operation of a property as are the direct costs more easily accounted for and therefore more obvious. That they or some of them have (a) been so treated in accounting that they have been lost track of, or (b) that in accounting they, or some of them, have been charged to some one account "which can stand it," does not affect the equity and propriety of establishing the expenditures such as (a) or revising the accounts in such instances as (b). Furthermore, the lack of data in any specific case by no means justifies the presumption that no such expenditure is involved when it can clearly be shown that an expenditure of such a nature *must* be involved. The lack of exact data in a specific case or in regard to an item, justifies the exercise of prudent, conservative judgment, based on experience, in estimating the amount of the expenditure. Justice Hughes' solemn words in his Supreme Court Minnesota Rate Case should be constantly in mind in making estimates of Indirect Costs, or Direct Costs for that matter, where there is a lack of data available in any particular instance. Justice Hughes said:

"But it does not justify the acceptance of results which depend upon mere conjecture."

Reasonable estimates based on broad experience are necessary in every walk of life, and such estimates are not referred to by Justice Hughes as "mere conjecture."

In this discussion it will not be necessary to refer to any item of indirect cost for which there is not an ample basis available for what is a reasonably accurate estimate of cost, when in any particular instance investigated certain data for some item will be lacking but present in some other situation; while these cases providing data of one kind will themselves lack certain other data.

We, in this discussion, are dealing with only one of the elements of cost, and cost does not establish value. A thing may cost more or less than it is worth; in the consideration of worth or value, fair value, the entire cost of the thing valued, has a most important bearing on value. If the cost has been reasonable, the project a judicious one, and the service rendered valuable, then the value must obviously exceed the entire completed cost. Under other circumstances the value may be less than the cost.

Indirect costs are present in operating expense as they are in construction expense, and to about the same extent or proportion of expenditure involved. Therefore in an ordinary utility engaged in both the function of operating and the function of construction for capital account, when an expenditure, say the president's salary, is paid, it is a cost attributal to both functions, and that payment should be apportioned as an indirect cost to the various activities according to a well-defined and equitable basis. It is no more proper that it be charged wholly to operating than that construction should carry the whole presidential expense; this is true of every corporate expenditure having more than one purpose as a cause for its having been incurred. It is not equitable, nor fair, to say we are an operating company and must have a president and that construction is an incident, because additions and betterments are equally a necessity of the utility and there is no reason for treating, for example, the president's salary and his office and other expenses, as solely operating expense, than it is proper to charge operating with a brand new service line, an obvious capital charge. If the accounting system (as some do) requires that such an expenditure be charged to that operating account mostly concerned, then when, in an appraisal, for instance, we wish properly to apportion the proper ratio of the expenditure to capital, we must likewise credit the charged account with the amount in dollars and cents that we in the appraisal are ascribing to capital—this means, that by this same amount net earnings reinvested in the property, has been correspondingly increased. We ask a return upon reinvested earnings, and we must likewise show this as increased earnings over what the books disclose, and count it as net return in a revised set up of the books. I am afraid that this is not always realized, and is in part the reason that the magnitude and justice of the indirect construction costs are often questioned.

It is now universally recognized that indirect costs are part of the total costs to be ascertained, but there is a perfectly natural tendency on the part of the public to minimize their magnitude when a public utility is being valued for any purpose, while the effort should be to establish honestly their fair amount; we more easily estab-

lish the direct costs because of the simpler accounting for the direct costs. It is becoming in us to indicate clearly the nature of each indirect cost involved in each situation and so itemize them as to permit their proper consideration. It is essential that reasonable discrinimation be employed in the estimated distribution of the indirect costs to the different parts of a property or "plant accounts" as the segregated parts of a property are sometimes called. Certain of the indirect costs are applicable to certain parts of the plant; all indirect costs are not all applicable equally to all parts of the plant, and some of the indirect costs do not apply to certain parts at all. Superintendence, as I shall use the term, is not an item in the cost of land. Engineering is, but to a lesser extent usually than engineering enters into say the cost of a central office.

When a brand new property which has never operated is being valued, this problem of apportionment is relatively simple, because all expenditures are on capital account and the problem is only to apportion the indirect costs to the various parts of the plant.

Likewise if the property is a finally completed one, never increased nor diminished, finished once and for all, the indirect cost incurred subsequent to the plant's completion need be apportioned only as between the operating function; they are all deductions from revenue. Our real difficulty comes with the consideration of the usual case of a utility starting in a relatively small way, years ago, which has had practically no early accounting or recorded history, or else during its life has had a variety of accounting methods, interpreted differently at different periods. The property has grown with increasing needs of the community, its enlargements made partly from invested earnings and partly from new capital without any possibility of showing by the records the amount of money actually spent on new plant; how much in replacing retired plant, or, often, the source of the money, or when much of it was spent. Old accounting methods were the best available data of the respective periods, but our ideas, everyone's ideas, of what constituted a capital charge and what an operating charge have changed radically; what was at one time regarded as a praiseworthy, conservative financial policy is now regarded as very wrong indeed.

It is very unfortunate that such questions should ever arise for determination in the heat of the rate case. Such matters are so much more fairly considered quietly and judicially when there is no ulterior political purpose to be served and when no axe is to be ground for either the individual member of the community or the utility itself.

One of our "funny papers," *Life*, best pictures the scene presented by a rate case. "To determine a fair price for any commodity or service, take one dozen investigators at a large salary, fifty-seven lawyers, eighteen statisticians, and any desired number of detectives, experts, stenographers, etc. Mix in a large hall. Add the testimony of a couple of dozen buyers as to the *amount they want to pay* for the commodity or service. Sprinkle in four hundred absurd and insulting questions to sellers of the same. Stir briskly; boil six weeks, allow to simmer fourteen months, and divide the product by two. The result may not have any sense in it, but it will have as much as by any other way of getting at the matter, and it will *please more voters than it will immediately ruin.*"

It is for us all, now, to eliminate the travesty which amounts always to a tragedy; to do so the closest analysis is essential of what constitutes a *Valuation.*

1st. *Preliminary Costs,* or those necessary expenditures which precede any actual construction: the studies of the project, to determine its scope, etc., and the cost to secure the public rights (not including payments, if any, to the public for those rights) and approval of the regulating or governmental bodies. I also include within this group the expense of raising the money with which to construct, and a proper promoters' remuneration.

These preliminary costs precede all other expenditures in chronogical order, or most of them are so incurred, and they are usually dealt with or estimated as percentages of and upon the total cost of the property including both direct and indirect costs. They are properly direct costs, but by reason of the manner of their expression and by custom are considered as indirect costs and I will therefore so discuss them with the other Indirect Costs referred to under 3rd, (b).

2nd. *The Inventory*—this is a listing, a cataloging, a count of all the property of the utility, seen and unseen, physical and non-physical. It is the making of a detail picture, systematically put together, of what the utility possesses as accurately as is humanly possible. There is rarely any material dispute about this part of the valuation.

3rd. *Total Construction Costs* of all this property, what it had cost or reasonably would cost to produce it, as of the approximate present time; and this study, or estimate, is for convenience, divided into two subdivisions —Direct Cost and Indirect Costs, the sum of which constitutes total cost of construction.

(a) *The Direct Costs* principally consist of units of average costs applied to the quantities shown to exist through the inventory. Great care should be exercised to insure a complete knowledge of what part of the costs are contained in the unit or other direct costs and if practicable, an exact theory should be carried out in the development of the direct costs, whether unit costs or other special items not reduced to an average, in order to simplify the checking and comparisons with general experience. Sometimes "Contingencies," or "Liability Insurance" or such matters may be contained in the cost units, or with equal propriety dealt with as Indirect Costs. In a given appraisal such items should properly be dealt with in either the Direct group or the Indirect group of costs rather than partly in one and partly the other.

(b) *The Indirect Costs* are those expenditures which are common to the several functions or parts of the property and which are necessarily apportioned to the various functions or plant accounts. Interest during construction is an example of an indirect cost which differs greatly in amount among the different plant accounts, due to the different lengths of time which elapse after the money for their production begins to be spent and before they become useful parts of the property.

There is, as a rule, a greater divergence of opinion about the magnitude and items to be included within indirect costs than over the other cost elements, because they are indirect and are apportionments; therefore, those who are inexperienced do not realize their variety or magnitude. Also as against obvious unfairness, proof of reasonableness is more difficult because less direct. Much honest disagreement is due to the fact that the subject is dealt with or estimated by men who have not always had complete experience. Recently I have had to do with the estimates of a very distinguished engineer accustomed to taking entire charge of the construction of very large properties, and who quite overlooked the importance of the corporate management and treasury expenses outside and in addition to his functions as constructing engineer. While it is true his duties were most important, they were

by no means the only indirect but real expenditures necessarily made; he did not realize the cost of caring for and accounting to the trustees for the money to be spent, nor did he appreciate the cost of directors' meetings, for instance, and many other such matters which in the aggregate, were large in amount, but he had never had occasion to know what such costs were—as a matter of fact, must be.

It is these preliminary and indirect costs incident to construction that you have asked me to explain and then analyze and inventory. This I will do, following as closely as possible the methods of organization which I employ as a constructor. It is impossible to draw exact lines between groups or items, because in actual practice the personal equation of the men involved affects an economical organization, utilizing each man for that for which he may be particularly qualified.

Other executives, constructors or appraisers will express themselves differently; no two executives, for instance, will organize their forces in quite the same way. It will be found that broadly experienced estimators will not materially differ as to the total magnitude of the indirect costs, where they include all the indirect costs involved, however the estimator may express himself.

Let us first take up the preliminaries: (a) Development of the Project, (b) Cost of securing the money with which to construct, (c) Promoter's remuneration.

a—*Development of the Project*: (1) The conception of the Project, (2) Determination of its scope and territorial breadth, (3) Preliminary outline design and estimates of cost, (4) Estimates of operating expenditures, of operating revenue and resulting profits, (5) The prospectus or description of the project, (6) Development of the financial plan, (7) Legal and other advice, (8) Negotiations with bankers or underwriters for capital funds, (9) Negotiations with state and community governmental bodies necessary to secure the state charter, franchises, and the approval of the franchises, prospectus and financial plan by the Board of Public Utility Commissioners and other such matters, but not including any payments to the public for the public rights, nor including any valuation of those public rights.

The nature of the problem confronting a new utility or confronting the estimator of what it costs the promoter (call him or his function by whatever name you will) or has cost, to plan, arrange for, gain the essential rights to establish a public utility to provide the public with a necessary, useful, valuable service, is made fairly clear by this list of nine headings which I intend only as an outline without mentioning every feature, for that would be impracticable; the details differ in different situations, kinds of utilities, and as carried out by different individuals and would be named differently by others. However, that the general problem is there will not be disputed, nor will the facts that the work involved is essential and its cost is large—not including any payments made to the public; for if any such are made they become an element of direct cost and should be included in the direct costs. The magnitude of the problem and the costs will vary almost exactly with the scope, territorial extent and size of the property; experience shows that this is true and I believe it is obviously so. No old accounts that I have ever seen show what it has cost, and though present-day systems provide for it, they have not been in use long enough, and few considerable properties have been conceived and built in their entirety since the modern accounting systems have existed. There have been instances in recent years where such costs have been kept, and are known, and there have been many estimates and allowances made by experienced men and by commissions. The cost must therefore be estimated upon experience and analysis. Practically all the items are, in one form or another, accompanying expenditures with each increment in the property as the property grows and extends its usefulness; they constitute, of course, a larger proportion or percentage of the costs of constructing a brand new incomplete though operating property than they do of an old progressively developed property. Experience shows this to be true, and I think it is obvious. Experience shows that similar types of men are necessary, that they are essential, to the subsequent administration of the property during construction and operation. Experience shows that the time involved in the development of the project would probably be greater than for the construction of the property by the same men; it would at least not be less. Therefore, it is reasonable that this cost of the development of the project should be taken as of about the same cost as is administration including legal advice during construction. There is a variation due to the nature of the property and by reason of the laws of the state in which the utility is at home. The laws of some states require more, and some less, "observances," "rights," "approvals," etc.

b—*Cost of Money*. Money must be secured for any particular enterprise. There is a cost incident to the acquisition of the first money needed to inaugurate any enterprise, and there is a cost incident to the acquisition of the money for each enlargement of the property. There always is and always will be such an expense involved; it is sometimes, in fact usually is, merged in and becomes a part of "discounts," "brokerage," etc., on bond or stock, or both, which may be sold. "Discount," as ordinarily the word is used, is composed of two separable elements: the cost of the money—properly a capital expense, and indirect adjustment—that is any variation from the face value to adjust the market's demand for interest on the particular security at the moment of sale.

I am here referring only to that part of "discount" which is incident to the *expense of procuring the money with which to construct*. The corporation might sell its securities "over the counter," which would involve an expense, or may employ agents for the disposition of securities, commonly known as brokers, underwriters, bankers, etc. When we wish to rent or sell real estate we employ a real estate agent to do it for us, because that is his business, and he can do it and make a profit at a less cost or to better advantage than we could rent or sell the property for ourselves. There is a cost in either case attendant upon each such transaction, *i. e.*, the value of our own time and effort taken from our own ordinary occupation, vs. the payment of money to an agent, whose ordinary business it is.

Money can rarely be secured at home by any utility, therefore the necessity for acquiring capital which is necessary to construct in the greater money markets. Funds from these markets are invariably supplied through "bankers" or "brokers," who assume the risk of sale of the securities and thereby assure to the utility the money as required, regardless of the money market—this assumption of this risk is often costly. The bankers also make an investigation of the property from the engineering, legal and commercial points of view at a considerable expense, and on them falls the expense of selling to the ultimate buyer.

There is a world-wide competition for money. Money is needed for the stock yards of Chicago, for the

water supply in New York City, for the tramways of Tokio, and the utilities of West Virginia. There is a cost incident to getting it. *That cost* is a proper capital charge and the question is what is a *fair amount* to allow?

Until within two years there has not been available any actual data as to the cost; now there is, thanks to the liberal view taken of the matter by certain large financial houses and large utility operators.

From this data, together with other financial information and the comparative rating of various securities of various corporations, the cost of money may be estimated very satisfactorily in any given case.

The propriety of allowing this item in determining the fair value has been favorably passed upon by commissions and courts in this country, but the clearest and most complete analysis is contained in the language of the English Justice Lawrence in the Railway and Canal Commission, Royal Courts of Justice, in the condemnation case of the National Telephone Company, Limited, vs. His Majesty's Postmaster-General.

The interest adjustment or true "discount," or "premium," is easily determinable, for it is the amount less or more than par at which the securities are taken by the general public or ultimate purchaser: The cost of money is the difference between the price paid by the ultimate purchaser and the net amount received into the "till" of the corporation.

If bonds are sold at above par it simply means that the par or face interest is higher than necessary to satisfy the money market. The same bond is sold sometimes above par and sometimes below par, according to the demands of the money market at the moment of sale: Money is a commodity which varies in its requirements much as wheat or other commodities vary. The cost of money, however, is distinct from discount or premium and is the difference between that paid by the ultimate purchaser and the amount received into the corporation "till."

Our inquiry is as to the cost of raising all the money which it would take to construct at the present time, the per cent of cost of selling the securities through which the money is raised shall therefore be applied to the entire estimated cost to construct the utility.

Generally speaking, the money with which to construct is secured through the sale of various kinds of securities; common stock, preferred stock, second mortgage bonds, notes, as well as first mortgage bonds. Under the language of Mr. Justice Lawrence it is the cost of money to the person of the highest credit that is to be used in application to the whole, although, and it is obvious, that the cost of selling the junior securities would be greater than the cost of selling the senior security of any given corporation.

I want to be sure that I am understood clearly how to differentiate between interest adjustment and cost of money. For example, let us assume:

Par value of bond	$1,000
Interest	5%
Bond sold to ultimate purchaser for	975
Net amount received into corporation "treasury"	925
In such a case the cost of the money would be 5%, which is properly capitalized	50
The Interest Adjustment required by the money market or "Discount" would be 2½% of par	25
or again	
Par value of bond	1,000
Interest	5%
Bond sold to ultimate purchaser for	1,030
Net amount received into corporation "treasury"	980
In this case the cost of the money would be 5% properly capitalized	50
The interest adjustment required by the money market is here a premium of 3%, *i. e.*, the market at that moment did not demand 5% interest	30
or again	
Par value of bond	1,000
Interest	4%
Bonds sold to ultimate purchaser for	800
Net amount received into corporation "treasury"	750
In this case also the cost of money would be 5% of the face value	50
The interest adjustment required, however, is here 20% on this 4% security if the assumed market required 5% interest	200

c—*Promoter's Remuneration.* "I know of no commodity and of no service that can be secured, as a right, for nothing."—Mr. Justice Lawrence.

Enterprise without the service of a promoter is inconceivable.

What is it which would induce any promoter, or any group of persons to make such a preliminary expenditure as I have described under "Development of the Project," and then provide the money and assume the great risks? 1st. That the project would fall by the wayside and never come to fruition at all. 2nd. Its failure afterwards.

Why should the promoter render such a service as he has rendered to the public in providing these utilities?

Promoter's remuneration, as dealt with here, is profit and is entirely distinct from cost to the promoter.

There must be some inducement to bring about the activities of the promoter in the particular enterprise, and that inducement is profit or gain, and for his gain he renders a valuable service. The service of the promoter is essential at all stages of the utilities development, at first and with each increment of capital needed for enlargement, extensions, etc.

The Railroad Securities Commission appointed by President Taft, of which Arthur T. Hadley, president of Yale University, was chairman, said on page 30 of its report:

> We are told that the profit of the promoter represents a wholly unnecessary burden upon the American public, and that so far as this profit can be done away with it will be good for all parties. Neither of these statements is quite true. The promoters, using the term in a broad sense, may be divided into two classes: Constructors who build a railroad whose future is uncertain, in the expectation of selling the stock for more than it cost them; and financiers who induce the public to buy the bonds of such roads. Both of these classes, if they do their work honestly, render useful service to the public. The constructor gives our undeveloped districts the benefit of new roads, which they would not get without his intervention; and if he does his business well he builds the road more economically than anybody else could. The financier renders an equally important service in collecting the capital of the investors to build new railroads or improve old ones.

There are many other similar statements made by commissions, courts and other authorities. I think all commissions have recognized that the services of a promoter should be properly remunerated. The California Commission, in the case of the Central California Gas Company, California Commission Reports, Vol. 2, page 120, is very clear on the subject.

In the city of Danville, et al., vs. Southern Railway Company (1 I. C. C. R. 409, 438), the Interstate Commerce Commission said:

> This enterprise is a perfectly legitimate one. The men who have conceived and executed it are entitled to a fair return upon the money which has been actually invested in it. They are entitled, in addition, to a reasonable profit upon the ability to conceive and execute a project of this sort.

When a public service commission is determining the fair value of a property, it should make no difference whether the property is old and had been rendering a

valuable service, or whether it is new and much desired by the public; the same elements should enter into the value on which earnings are allowed, and what is a proper allowance necessary to induce a new and valuable enterprise must also be a proper allowance to allow on account of the promotion of an enterprise in existence, and of undoubted public use, and in which the risk has been incurred and the service rendered.

We have little data on which to base the amount of profit which should fairly be allowed—in arriving at the amount the early risks should be clearly in mind.

In the application of the Rochester, Corning and Elmira Traction Company for consent to the execution of a mortgage and authorizing issuing of capital stock, the Public Service Commission of the State of New York, 2nd District, in Vol. 1, of the report of April 1, 1909, page 166, deals with the whole subject very fully (as it has been by many other commissions), and it allowed five per cent as promoter's remuneration, and that commission has allowed five per cent in the case of other projected utilities.

In the decision written by Chairman Stevens in the case referred to, he speaks of the difficulty of determining the exact amount which the promoter should be paid under the varying conditions. He fixed five per cent for a proposed railroad in the Empire State, the desirability of which he had passed upon favorably. My judgment is that Chairman Stevens' allowance was too small for such a new project—the road was not built—yet he is a man intentionally fair and of good judgment, with good opportunities for observation. Five per cent has been accepted in other cases and is a frequent minimum provision in promoting large enterprises, but it is too small certainly for small enterprises.

INDIRECT CONSTRUCTION COSTS.

We now come to Indirect Costs incident to the construction of the property. The subject is more familiar and I believe little explanation is necessary in addition to what has already been said. I believe a simple grouping under *Construction Department* and *Treasury Department* with the list of the principal items under each heading will be self-explanatory.

The Construction Department produces the physical property—spends the money.

The Treasury Department arranges for and cares for the funds which are to be spent by the Construction Department, and also looks after certain items of a more or less fiduciary nature.

It will be appreciated that no exact line of demarcation is intended as between items—that must vary under the circumstances of each case; the purpose of the details or list is to indicate the nature of the expenditures involved.

With complete knowledge of what is contained within the direct units of cost it may be found that certain details may be omitted from the indirect list.

It is my practice to include in the direct costs all material and cost of delivering to the ground and all labor up to the job or local foreman of a gang—beyond these direct expenditures come the indirect.

It is my practice to include all omissions within the inventory of the property as an increase in quantity to make up for what should have been seen and counted, but, due to the human element, was omitted. I included it in the indirect list as given here "E" because it is also common practice, but it should not be in both places.

It is likewise my practice to include a proper contingency item in my direct costs, but this is so often included in the indirect costs that I list it as "F."

R—Liability Insurance may be included with equal propriety in direct or indirect costs, but not with propriety in both.

CONSTRUCTION DEPT.

A—Administration (in part remainder see P)
1. Executive officers and their expenses
2. Clerical
3. Cost accounting and auditing
4. Postage, telephone, telegraph, stationery
5. Rent
6. Legal advice in general to all departments

B—Engineering (not Construction Engineering, see D8)
1. General designs for property as a comprehensive whole
2. Group designs for property (acct. numbers)
3. Detail designs for items
4. General specifications by class of property
5. Detail specifications for contracts or purchases
6. Consulting engineers and architects
7. Inspection of materials at sources
8. Inspection of plant as progresses and for acceptance
9. Surveys, soundings and special studies
10. Progress studies and certificates on which payments are made and money received from trustee

C—Supply Expense on Material
1. Purchasing agent and department expense
2. Traffic supervision (not freight or cartage)
3. Warehousing and storage
4. Loss or breakage in stores

D—Supervision
1. Superintendence in general
2. Office equipment and expense (like A2-4-5)
3. Work orders and requisitions
4. Employment of labor—housing, settling disputes, etc.
5. Time keeping and material checking in field
6. Assistant superintendence of property groups
7. General foremen
8. Construction engineering, methods of doing the work and ways and means, arrangement and use of machinery and false or temporary work

E—Omissions
Considered in making inventory, *i. e.*, things which could have been seen but which were not seen or counted, *i. e.*, omitted

F—Contingencies
Those things or conditions necessary to the construction of a property which disappear and leave no trace and are not of record in old properties; somewhat like the 15% ordinarily added finally to an estimate

G—Experimentation
Necessary to adoption of alternative methods or devising economical advances in the art

TREASURY DEPT.

P—Administration (in part remainder see A)
1. Executive officers (proportion like A 1)
2. Executive expense (proportion like A 2-4-5)
3. Auditing
4. Treasurer and his office expense in caring for funds
5. Trustees' expense in issuing funds on engr. certificate
6. Legal advice on corporate and such matters

Q—Taxes and Fire Insurance

R—Liability Insurance
1. For employees based on labor roll
2. For public based on labor roll
3. On sub-contractors based on *total* of contracts

S—Interest During Construction

I believe it will be found that as simple a problem as confronts any family contains all the factors confronting the public utility. What can be simpler than the drying the weekly washing of an average family in an average community?

Such a family occupies a small house on a small lot; this establishment is either owned or is rented. It has definite boundaries, and the adjacent neighbors must be considered. There is a bit of ground behind the house and there may be an unfinished space under the roof, and let us hope there are several children in the home. Of course, put up some poles in the back yard, and for a rainy day some nails in the roof space. Costs nothing to operate and only the cost of some poles and rope and a few nails—is it so?

Think about it with these lists of ever present indi-

rect costs before you, and I think you will find every one of them, or their equivalent, present in this construction of a facility for drying the family wash, yes, or any other ordinary activity or function. There is nothing in the utility problem not present in any other, or vice versa, only we are in the habit of overlooking certain costs or wrongly charging them to something else.

We must all agree that every function, effort, resource, as well as money investment has value—is valuable. Our pleasures have great value, for we pay largely for them—time taken from our periods of rest and pleasure are therefore a sacrifice, just less than the cost of employing some one to do it for us; a game of tennis or a bicycle ride has value over its cost and taking our time for something else costs the sacrificed pleasure, which pleasure is of value. We spend much for our children's amusement—toys, etc.,—for that means their health, and we ought not sacrifice that.

The small back yard is our family's playground, flower and vegetable garden, and rambunctious healthy children play on bright days in our back yard (to keep them off the street), and on rainy days they still must play and the roof space is much better so used than to have them play horse in the parlor or kitchen with the resultant destruction and annoyance. Our family is one having limited means and every penny, every cent counts. Where shall the clothes yard be put? All these must be considered in estimating the first capital cost and the subsequent operating cost of the facility!

Properly apportion every hour spent in considering the problem, every cent of money spent. The capital apportioned value of the right-of-way for the clothes-poles, design, surveys, supervision, etc., and is it not obvious that the indirect costs have amounted to much more than the cost of the poles, rope and six nails? And then the operating costs, depreciation, labor of moving the wire or rope indoors every week or whenever necessary, etc.

Now suppose that the next door neighbor has the facilities for drying our family's clothes and is willing to render the service to our family but wants a recognition, in the charge for the service, of the value of the facilities provided by him and his operating expenses and a fair return or profit, call it what you will. Shall he ignore the value of the land devoted to the use? Shall he count only the poles, wire, and clothes pins, or is he entitled to a return or profit upon the indirect costs also? His energy in providing the facilities and his sacrifices in the way of "off time" and recreation, what of them? What indirect costs may he reasonably add to the direct costs?

Pole Tax Illinois Test Case

In allowing a petition for certiorari in the case of the city of Springfield, Ill., against the Interstate Telephone Company, the supreme court opened the question of whether or not a city has a legal right to charge such companies a yearly tax for telephone poles on city property.

The $1 yearly tax charged by the city of Springfield was upheld by the circuit court, but the decision was reversed by the appellate court. The supreme court in allowing a writ of certiorari reopens the case.

The case is a test case and the decision of the supreme court will be watched with interest by Illinois cities having such an ordinance and by those contemplating one.

At Elgin an ordinance was passed which is similar to the one adopted by the men of Springfield. Public utility companies have refused to pay the Elgin tax, declaring that the city cannot legally collect. The decision will be important there as well as in Waukegan.

Fight Mergers in Pennsylvania

H. E. Bradley, secretary of the Eastern Traffic Association, with offices in the Philadelphia National Bank Building, who handles the affairs of more than one hundred of the Independent telephone companies operating in Pennsylvania, says it is rumored an effort will be made by the Bell Telephone Company interests to have the Pennsylvania State Constitution amended so that at least a part of the Independent lines may be absorbed.

"Our forces are being held in readiness for such an emergency," said Mr. Bradley. "It is reported that the movement will be started from New York."

Knowledge of such an impending effort is denied at the general executive offices of the Bell Company and by Edward M. Cooke, second vice president of the Keystone Telephone Company of Philadelphia.

Mr. Cooke said that possibly the rumor had originated owing to the Independent systems of Hazleton, Allentown, Reading and Scranton recently coming under the agreement sanctioned three years ago by the attorney general's department, whereby an interchange of toll service is allowed outside the fifty-mile limit.

Both Mr. Cooke and the Bell officials, the latter through P. C. Staples, the publicity agent, who makes all announcements for the company, pointed out that no absorption, control or closer working agreement than is at present in force with regard to toll service could be effected without a change in Article XVI, Section 12, of the State Constitution, which applies in wording specifically to telegraph companies, but which has been held by the supreme court to apply also to telephone concerns. This section reads as follows:

> Any association or corporation organized for the purpose, or any individual, shall have the right to construct and maintain lines of telegraph within this state, to connect the same with other lines, and the general assembly shall, by a general law of uniform operation, provide reasonable regulations to give full effect to this section. No telegraph company shall consolidate with, or hold a controlling interest in, the stock or bonds of any other telegraph company owning a competing line, or acquire, by purchase or otherwise, any other competing line of telegraph.

Reorganization of Service Committee Work

As a result of action taken at the joint convention of the Eastern and Western Pennsylvania Independent Telephone Association, held under the auspices of the Eastern Traffic Association in Harrisburg on September 6, a reorganization of the work conducted by the service committee of the two associations through their service engineers became effective on November 1.

In the Eastern Pennsylvania territory this work has been carried on since December 1, 1915, by Service and Traffic Engineer C. J. Larsen under the supervision of a service committee of the Eastern Pennsylvania Independent Association of which E. M. Prisk, general manager of the Consolidated Telephone Company of Hazelton, Pa., was chairman. On August 1, Mr. Larsen resigned this appointment to take up similar work with the Kansas City Home Telephone Company of Kansas City, Mo.

In the western end of the state the work has been conducted from April 1, 1914, to December 1 of the same year by Service Engineer Fred J. Heavens and since that date, following Mr. Heavens' resignation to affiliate himself with the Pittsburgh and Allegheny Telephone Company, by W. H. Hay of Pittsburgh, under the supervision of a service committee of which William S. Paca, general manager of the Petroleum Telephone Company of Oil City, Pa., was chairman.

Since Mr. Larsen's retirement, Mr. Hay has filled the position in the eastern territory temporarily, in connection with his work in the western part of the state.

Under the new plan, the movement will be financed through the Eastern Traffic Association, of which H. E. Bradley of Philadelphia is secretary.

Service work over the entire state of Pennsylvania will be conducted by a state service engineer with two assistants, one of whom will be an assistant engineer to carry on transmission work, and a traveling chief operator whose function will be the conducting of operators' schools and a general observance of toll and long distance operating methods.

The state service engineer will supervise this work and in addition will conduct operators' schools and look after the betterment of transmission conditions generally.

W. H. Hay of the Western Pennsylvania Association has been appointed to the post of state service engineer, and will announce later the names of his assistants.

The movement will be under the general direction of the executive committee of the Eastern Traffic Association and under the direct supervision of a service committee of that body. This committee is composed of Richard Hawley, vice president and general manager of the Pittsburgh and Allegheny Telephone Company of Pittsburgh, who is chairman, C. A. Carl, general manager of the United Telephone and Telegraph Company of Harrisburg, and Edward M. Cooke, general superintendent of the Keystone Telephone Company of Philadelphia.

Mr. Bradley will co-operate with Mr. Hay and, being in close touch with the work, can be communicated with by member companies of the Traffic Association in regard to any matter concerning it.

Arrangements are also completed whereby the service engineer can be communicated with at Harrisburg and at Pittsburgh.

The executive committee of the Traffic Association feels that under this reorganization plan still greater efficiency can be realized in the matter of improving and standardizing toll and long distance operating practice and in enhancing and widening transmission conditions over Independent lines and feels assured that the member companies of the association will accord the same hearty co-operation to the new service committee and the service engineer and his staff, that has been given in the past to the service committees of the state associations.

Electrical Timber Seasoning

seasoned timber and the difficulty of allowing sufficient time between felling and use to ensure a thorough seasoning by natural means, considerable interest attaches to a report in a Swiss building trade journal concerning a method of drying and conserving timber by electrical means. It appears that the effect of passing a strong electric current through freshly-cut timber causes a chemical change, producing rapid oxidation of certain parts combined with a physical change in the cellulose and its numerous derivatives, which renders them better able to withstand the action of certain fungi while increasing its suitability for mechanical use. It also confers an aseptic quality to the sap elements remaining in the timber.

The "Nodon" process, as it is called, is claimed to be so effective that in a few hours a thorough oxidation of the wood sap takes place, a process which in free air would occupy several months; the process reduces the hygroscopic tendency of the wood, so that it no longer readily absorbs moisture. The process can be applied to green timber with such success that in a few weeks a thorough seasoning takes place. A certain amount of moisture helps to carry the current through the timber, so that the treatment is best applied to timber in a not too dry condition—in fact, as soon as practicable after felling. It can be applied in the forests where the trees are actually felled, thus reducing transit weight. The electrical energy required ranges from three to six kilowatts per cubic meter.—*Electricity.*

Pipe Line Companies' Communication Systems

As is the case in the operation of a railroad, means of instant communication between the different parts of the tremendous pipe-line systems used in the cross-country transportation of petroleum is absolutely necessary. For this reason the pipe-line company must establish a system of telegraph and telephone lines which will be under its control and available for its use at all times. In some cases the companies are able to avail themselves of facilities already existing either by leasing wires from some telephone, telegraph, or railroad company which has a conveniently located line, or by securing the privilege of stringing its own wires on their poles. In other cases, however, the pipe-line company must construct its own telegraph and telephone lines, especially when the route of the pipe line lies in sparsely settled regions and at some distance from railroads. The investment in telegraph and telephone lines of the large interstate pipe lines operating in the mid-continent field is considerable, and varies from $200,000 to $300,000 for each company.

The construction of the necessary telegraph and telephone lines is carried on at about the same time as the construction of the pipe line, by methods similar to those employed in the construction of lines for railroads and for ordinary commercial purposes. The operation of the lines is organized on similar lines to those employed on a railway, the oil dispatcher at the division or the general office corresponding to the train dispatcher on a railroad. The telegraph line is in constant use day and night. In addition to the messages directly connected with the movement of oil through the pipe line, the lines are used for much of the general business of the company.

Highest Telephone Pole

The tallest telephone pole in the world is where the wires of the Pacific States Telephone Company cross the Chehales river, near Aberdeen, Wash. For some time a pole ninety feet high was sufficient to keep the wires clear of the river craft. But the increasing passage of ocean steamers made a higher pole necessary, and a new one 126 feet high was set up. This pole is one single stick of Washington fir, 18 inches at the butt and 8 inches at the top. The pole weighs 6,000 pounds.

The stick was cut at a point twelve miles distant and towed down the river, where it was erected by twelve men using a twelve horse-power hoisting engine. For making attachments to the pole and raising it a five-eighths steel cable was employed, run through ten-inch steel blocks. The pole was set twelve feet in the ground and guyed with four steel-stranded wires at the top, and also guyed about forty feet from the top with four-sixteenths-inch wires.

Public Utility Commission News

Reports Concerning the Activities of State Regulating Bodies in the Telephone Field

California

RECOMMENDING that the Pacific and Home Telephone companies be permitted to consolidate, the telephone committee of Los Angeles Municipal League, through Secretary Seward Simons, filed with the State Railroad Commission its report on the subject as approved by its executive committee.

The league notes that the companies, during the hearing, agreed that in case consolidation is permitted they will not apply for an increase of rates within two years. The league asks that this be extended to five years. It also makes the following recommendations:

That suitable arrangements be insisted upon to protect the interests of the outlying portions of the city in the event of consolidation.

That the new company be freed from any arbitrary requirements to purchase from the Western Electric company and to pay 4½ per cent of its gross receipts to the American company, or the Bell monopoly, which controls the Sunset, or Pacific.

That the new company in applying for a new transfer of franchise be required to stipulate that the city shall have the right to purchase at any time after five years.

That the city shall require the insertion of the usual clause in the franchise by which the company shall pay to the city of Los Angeles 2 per cent of the gross annual receipts arising from the use, operation or possession of said franchise.

The consolidation was authorized by the Commission.

Under the terms of the decision the two companies are to be sold to the Southern California Telephone company, a new corporation, which is authorized to issue $14,000,000 of securities in payment for the properties. This is a reduction of $2,098,500 in the total amount asked for by the two telephone companies. The Commission's order allows for $4,670,000 in stock and no more. The balance to be in five per cent 30-year bonds.

The Southern company will operate under the franchise of the old Home Telephone company, which expires in 1952. This provides for free telephones to city officials, for the free use of poles and conduits by the city police and fire alarm systems and for the payment of two per cent of the gross revenue to the city of two per cent annually.

As the conclusion of a long discussion of the telephone situation in Los Angeles the Commission states its belief that the consolidation will not only effect a large saving to the public, but will give an improved service without additional cost of operation to the new company. This amount is figured at $483,000 saved annually for Los Angeles.

Consolidation of the telephone systems at Riverside has been authorized by the State Railroad Commission, in a decision authorizing the Riverside Home Telephone and Telegraph company to sell its property, franchises, and the like to the Pacific Telephone and Telegraph company, and the latter is authorized to acquire the property.

The present value of the Riverside Home company's property is placed at $218,089 by the Railroad Commission. The authorization for the transfer is not effective until the Pacific company files a petition with the Railroad Commission asking permission to acuqire the capital stock and the Commission renders its decision.

The Railroad Commission's order is as follows: The Pacific Telephone & Telegraph company having filed its petition herein as indicated in the opinion which precedes this order, and a public hearing having been held,

The Railroad Commission hereby declares that public convenience and necessity require the exercise by the Pacific Telephone & Telegraph company, its successors and assigns of the rights and privileges granted by the city of Riverside by ordinance No. 201, new series, approved on April 5, 1915, provided that the Pacific Telephone & Telegraph company shall first have filed with the Railroad Commission a stipulation duly authorized by its board of directors agreeing for itself, its successors and assigns, that it and they will never claim before the Railroad Commission or any other public authority of any character, any value for its rights and privileges granted by ordinance No. 201, new series, of the city of Riverside, in excess of the consideration paid by the grantee of the said franchise to the city of Riverside at the time of the granting thereof, which consideration shall be specified in the stipulation, and shall have secured from the Railroad Commission a supplemental order herein stating that such stipulation in form satisfactory to the Railroad Commission has been filed herein.

The foregoing opinion and order are hereby approved and ordered filed as the opinion and order of the Railroad Commission. Dated at San Francisco, California, the 6th day of November, 1916.

Max Thelen, H. D. Loveland, Alex. Gordon, Edwin O. Edgerton, Frank R. Devlin, commissioners.

The franchise was valued at $100.

The Pacific Telephone company has owned a controlling interest in the Riverside Home Telephone company since 1912, according to the testimony of President G. E. McFarland of the Pacific company before the State Railroad Commission. He testified also that the Pacific company owns $95,500 of the Home Telephone company stock, acquired for $20 a share, and $168,000 of Home bonds, for which 55 per cent of the par value was paid.

The Railroad Commission has issued a supplemental order to its recent decision in the application of the Hughson Telephone company for authority to sell its telephone system at Hughson, Stanislaus county, to the Pacific Telephone and Telegraph company, approving a stipulation that the Pacific company will not claim more for the franchises granted by the town of Hughson than were paid for them.

The Pacific Telephone and Telegraph company has filed with the Railroad Commission an application for a certificate that public convenience and necessity require the exercise by it of the rights and privileges conferred upon it under the franchise granted it by the trustees of the city of South San Francisco July 6, 1915. The company has in South Francisco 284 subscribers at present, and proposes now to extend its system throughout the city. It therefore wants from the Railroad Commission the right to make these extensions under franchise.

An order finally approving the plans for consolidation of the telephone systems in Santa Barbara county and a small portion of San Luis Obispo county was issued by the Railroad Commission. The order also authorizes the issuance of securities by the new merger company. The original order of consolidation was issued on October 2.

The order sanctions the conveying to the Santa Barbara Telephone company, the new company, of all the lands, property and rights of the Home Telephone and Telegraph company of Santa Barbara and of the Home Telephone and Telegraph company of Santa Barbara county, and the Pacific Telephone and Telegraph company is authorized to sell to the new company the property attached to the Santa Barbara Exchange.

The largest amount involved is in the Santa Barbara franchise, $1,531.20.

Florida

The Home Telephone company of Jacksonville has been fined $1,000 by the Florida Railroad Commission for the alleged violation of the law and its tariff rates, as are on file in the office of the Commission in Tallahassee.

The fine followed a hearing held in Jacksonville, the concern being charged with furnishing free service to certain local "persons, firms or corporations."

The Commission has issued an official order, setting out the fine, and ordering a prompt payment of the amount to the state treasurer.

Georgia

After he had drawn an order directing that suit be brought against the Ashburn Telephone company to compel it to make answer to an order of the Railroad Commission,

Governor Harris received a telephone communication from one of the officers of the company and agreed to withhold his signature from the order until later, giving the company more time to comply with the Commission's demands. The Commission had ordered the company to show cause by a certain date why it should not establish a long-distance telephone line from Ashburn to Amboy. This order, it is said, the company ignored.

Illinois

The City of Kewanee has filed a petition with the State Public Utilities Commission to have an official of the Commission audit the books of the Kewanee Home Telephone company in connection with the application of the company for permission to increase the rates. The petition has been granted by the Commission.

The purpose of the audit is to get at the proper items of expenditures in connection with the local station.

An engineer from the office of the State Commission and one engaged by the city have completed their appraisement of the physical property of the phone company and are now engaged in making up their report for the city officials and for the Utilities Commission.

The Illinois Public Utilities Commission recently entered an order approving the contract between the Chicago Telephone company and the McHenry County Telephone Company of Marengo, for joint operation of their lines in Mchenry county.

The State Public Utility Commission has issued an order allowing the Independent Telegraph and Telephone Company of Nauvoo to increase its telephone rates. The business line rates were increased from $1.25 to $2.25 a month and the residence rates from $1 to $1.75 a month.

The Chesterfield Telephone and Telegraph Company at Chesterfield has been allowed to increase its rates by the Commission.

The question of invasion by a telephone company of territory occupied and served by another telephone company came before the Illinois Public Utilities Commission in the form of a complaint by the Northern Illinois Telephone company against the Farmers' Telephone Company of Sandwich.

It appears from the record in this case that both companies have their principal place of business in Sandwich, and that the Northern Illinois Telephone Company, organized in 1898, has about 3,370 subscribers in and around Sandwich, while the defendant company, organized in 1908, has about 25 subscribers.

Between the time of the filing of the complaint and the hearings held in this case the respondent constructed several miles of telephone lines in the rural district southeast of Sandwich and connected these lines with its then existing rural lines that enter Sandwich from the south. These new lines for the most part parallel the wires of the complainant and are located in territory which, prior to their construction, was occupied exculsively by the telephone system of the complainant.

By constructing these lines the respondent secured some fifteen subscribers to its system, who were heretofore subscribers to the telephone system of the complainant.

No complaint is made as to either the rates or service of the complainant in this case and the record shows that the service furnished by the Northern Illinois Telephone Company is equal, if not superior, to that of the respondent.

The respondent company contended that it had the right to build the new lines in question and that in so doing it has merely extended and added to its telephone system; therefore, that a certificate of convenience and necessity from the Commission was not necessary.

As in the case of the Byron Telephone Company against the Rock River Telephone Company, the Commission overruled this contention. The Farmers' Telephone Company of Sandwich, therefore (as was the Rock River Telephone Company), is ordered to remove or otherwise dispose of the telephone lines and equipment with which it invaded the territory of the complainant.

Indiana

The Citizens' Independent Telephone Company of Terre Haute filed a petition with the Public Service Commission asking approval for the issuance of $84,800 bonds to reimburse the company for improvements made since May 1, 1913. It represents that it has issued but $375,000 of an authorized capital of $1,000,000.

In a report of its business for the year the utility sets forth that its operating revenues were $162,015.89 for the year, while its operating expenses were $76,272.57, which is an increase in revenue of $9,975.48 and decrease in expenses of $6,731.87 over the former year. The company paid $17,346 in dividends last year out of its net income of $44,064.91.

Massachusetts

The Public Service Commission held a hearing to go over the relations of the New England Telephone Company and the Western Electric Company in regard to the purchase of supplies by the former from the latter.

Two other subjects were considered, the first relating to the alleged discrimination between business and residence rates for measured telephone service. Many complaints have been received by William H. O'Brien, chief of the bureau of telephones and telegraphs, during the last six months dealing with this phase of the subject.

Mr. Porter read his criticism of the service, and Whitfield S. Tuck supported him by contending for a general investigation. William H. O'Brien, who is the chief of the Commission's telephone and telegraph bureau, also urged a general investigation, referring to the failure of the legislature last year to provide for such an investigation, and he said that some of the company's unlimited service was "frightfully discriminatory."

E. K. Hall, counsel for the company, explained the rate fabric, and the reasons for maintaining different rates.

The claim is made that where the cost of installation is the most important item, as in the case of measured service, there can be no more expense attached to installing a business telephone than one for a residence. The price charged by the company then, the complainants argue, should be no more in one case than the other.

With regard to supplies, it is claimed that the company should purchase these in the open market from the lowest bidders, rather than from the Western Electric Company.

Telegrams had been received by the Commission from manufacturers of telephone supplies in Chicago who wanted opportunities to sell supplies to the New England company.

A third subject is the $18 rate for six-party service in smaller communities, the complainants alleging that telephone rates are based on the opportunity given the subscribers to hold conversation with large numbers of fellow-subscribers. It is urged by them that the cost of the telephone should be graduated. Two of the worst examples cited in connection with the flat rate of $18 per telephone are Fiskdale and Magnolia, the latter having less than 100 telephones in the exchange, while Gloucester, of which city Magnolia is a part, has 2,500 or more.

The complaints on this count have been coming to the Commission in a large volume for the past six months.

Michigan

Harold Erickson of Chicago, former Wisconsin railroad commissioner and a public utilities expert, told the State Railroad Commission that he believed the appraisal of the Michigan State Telephone Company's properties here by W. J. Hagenah, a Chicago engineer, was sound.

Mr. Hagenah's estimate, made during the hearings in June, valued the property at about $12,000,000.

Mr. Erickson also told the Commission that he believed the earnings of a public utility should be at least 8 per cent to pay a dividend and keep a surplus on hand sufficient for emergency. He placed the cost of establishing business at 10 to 12 per cent of its valuation and declared that the cost of obtaining capital had increased 1½ per cent in the last decade. He classed telephone companies third or fourth among public utilities in earning capacity, saying railroads headed the list, electric power concerns followed, and that street car corporations were next, about on a par with the phone companies as an attraction to investors.

On questioning by Attorney Stanley Gifford, representing the Board of Commerce in place of Attorney Hal W. Smith, his partner, Mr. Erickson declared that much allowance had to be made for depreciation of equipment and the new investments continually entering the telephone field. He said the average "life" of equipment is about 15 years.

Attorney Gifford planned to get Mr. Erickson to go into detail in explaining his methods of arriving at his figures.

Before the hearing was begun Commissioner Cassius L. Glasgow paid a tribute to the memory of the late Lawton T. Hemans, chairman of the Commission, who died recently. The hearing was the first since the chairman's death.

"Mr. Hemans was a man of unquestioned integrity, high purpose and noble in all his impulses," Commissioner Glasgow said.

Attorney Leo M. Butzell, appearing for the telephone company, also lauded the late chairman in brief remarks before the hearing was begun.

Corporation Counsel Dingeman attended the hearing, but took no part in the examination of the witnesses.

Mr. Erickson told the Commission he had been a railroad commissioner in Wisconsin for nearly eleven years, resigning less than a year ago. He was formerly labor commissioner of that state, and in early life was a railroad man. He said he had made a study of public utilities.

Minnesota

Thousands of telephone patrons in Minnesota will obtain substantial benefit through the new rate schedules of the two big telephone companies in the state—the Northwestern Telephone Exchange Company and the Tri-State Telephone & Telegraph Company—as these schedules make reductions in approximately 4,000 rates and affect all tolls for distances up to and including 12 miles. The new rates become effective December 1, 1916. These reductions are the direct result of an investigation by the Minnesota Railroad and Warehouse Commission of the toll business of the Northwestern company in Minnesota, which led the commissioners to believe that the minimum charge of 20 cents is excessive for short haul messages. Upon the commission's insistance that the short haul rates be modified, the Northwestern company reduced their rates to 15 cents for all distances up to and including 12 miles.

The former standard minimum rate was 20 cents for distances from 0 to 17 miles. Under the new schedule, a 15-cent rate is established for distances up to 12 miles, the old 20-cent rate remaining in effect on hauls between 12 and 17 miles. Of the Northwestern rates, 2,826 are affected by this reduction, and of the Tri-State, 1,077. Every exchange and every town in Minnesota directly connected with either company is affected and consequently all of their patrons are benefitted.

One result, as far as the companies are concerned, will be to reduce the income from the short haul business, because the new rate, like the old, will include a terminal charge of five cents at each exchange and hence the companies' return will only be five cents where they formerly received ten cents. The terminal charges are based on contracts between the toll companies and the co-operating exchanges, and are not affected by the new rates.

The mileage included in these rates is not, as many may suppose, based on the length of pole lines required to convey the messages, but on air line distances and in many cases the actual haul will be from two to four times the geographical distance between points.

"It must not be assumed that the State Railroad Commission accepts these rates as reasonable charges for the telephone service performed," said Commissioner Charles E. Elmquist, in discussing the new rates. "We authorize them solely because they make a substantial reduction and will, in our opinion, prove beneficial to the patrons of the telephone companies. We expect that the smaller toll companies will follow suit in this matter, in fact, one company already has made announcement to this effect.

"We are not in a position, as a commission, to say what is a 'reasonable' rate for any class of telephone service, because we have not at our command the facts and the data necessary for ascertaining what should be a proper charge that the companies could exact for their service. Steps are being taken to obtain this information, but the undertaking will be a long and laborious one, and after it has been gathered, there will be another long task in arranging and analyzing the statistics and applying them to the problem of rate making. When the work is done however, the Minnesota Commission will be in a position to decide whether certain rates are reasonable under the law and, if necessary, to make and put into effect proper rates.

"The present reduction is in line with the policy of the Commission to establish rates which secure to the company a just return and which will develop and encourage rather than restrict the telephone business."

In the matter of the petition of F. A. Falliher & Company, A. B. Bordsen, W. A. Pearson, Will Thompson, and 21 others, for telephone service in the depot of the Great Northern Railway company at Nevis, Minnesota.

The supervisor of telephones, Mr. Howatt, is directed to advise the petitioners that in answer to their petition, the Great Northern Railway company have advised the Commission that arrangements will be made at once for the installation of a telephone in their depot at Nevis, Minnesota.

This action on the part of the Great Northern Railway Company satisfies the petition and proceedings in the above matter are therefore dismissed.

Test of the right of the State Railroad and Warehouse Commission to order a co-operative rural telephone company to install service, with or without subscriptions to its capital stock, may result in a case heard and taken under advisement recently.

Mrs. Brita Pauson complained that the Clifton Rural Telephone Company, a co-operative organization operating rural lines out of Anoka, took the telephone out of her house on the ground that she was not a stockholder. Alleging that she offered to buy stock, she appealed to the Commission to order service restored.

The questions involved are among many relating to telephone regulations, and including that of the right of the company to discontinue service to subscribers who "listen in," which have not been raised yet in Minnesota.

In the matter of the application of the Canby Telephone Company to increase its rates for telephone service at Canby, Minnesota. Before the Railroad and Warehouse Commission of the State of Minnesota.

Application having been filed by the Canby Telephone Company, in which it is alleged that its present rate to each and all of its subscribers is $1.00 per month; that the present rates are inadequate and do not produce enough revenue to pay the necessary expenses and disbursements of the company, and it is therefore necessary to increase its rates to each and all of its subscribers to $1.25 per month.

It is therefore ordered that a hearing in the above entitled matter be, and the same is hereby fixed to take place in the Village Hall at Canby, Yellow Medicine County, Minnesota, on the 1st day of December, A. D. 1916, at 10:00 o'clock A. M. and that all interested parties may appear at such time and give evidence for or against the granting of such application. Notice of hearing shall be given by serving a copy hereof by mail upon the officers of the Canby Telephone Company and by publication in one issue of *The News*, of Canby, Minnesota.

In the matter of the application of the Richmond Telephone Company to increase its local exchange rates at Richmond and St. Martin, Minnesota, before the Railroad and Warehouse Commission of the State of Minnesota.

Application having been filed by the Richmond Telephone Company, in which it is alleged that the company has been for some time past and is now operating its telephone system at a loss, that there is a demand by its subscribers that it furnish a continuous 24-hour service, which is now being done, and in order to furnish such service and to secure a reasonable return on the investment, it is necessary to increase the local exchange rates as follows:

PRESENT RATE IN EFFECT AT RICHMOND.

Individual line business	$1.50 per month
Individual line residence	1.00 " "
Multi-party rural	1.00 " "

A discount of 10 per cent is allowed from the above rates if the bill is paid yearly in advance.

PROPOSED RATES FOR RICHMOND.

Individual line business	$2.75 per month
Individual line residence	1.75 " "
Two-party residence	1.50 " "
Multi-party rural	1.75 " "

A discount of 25 cents will be allowed on the above rates if the bill is paid at the company's office on or before the 15th of the month in which the service is rendered.

PRESENT RATES IN EFFECT AT. ST. MARTIN.

Individual line business	$1.00 per month
Individual line residence	1.00 " "

A discount of 10 per cent is allowed from the above rates if the bill is paid yearly in advance.

PROPOSED RATES FOR ST. MARTIN.

Individual line business	$2.75 per month
Individual line residence	1.75 " "
Two-party residence	1.50 " "
Multi-party rural	1.75 " "

A discount of 25 cents will be allowed on the above rates if the bill is paid at the company's office on or before the 15th of the month in which the service is rendered.

It is therefore ordered, that a hearing in the above entitled matter be, and the same is hereby fixed to take place in the Village Hall at Richmond, Stearns County, Minnesota, on the 28th day of November, A. D. 1916, at 1:00 o'clock P. M., and that all interested parties may appear at such time and give evidence

for or against the granting of such application. Notice of hearing shall be given by serving a copy thereof by mail upon the officers of the Richmond Telephone Company, the President of the Village Council of St. Martin, Minnesota, and by publication in one issue of *The Standard*, of Richmond, Minnesota.

A. C. CLAUSLEY, Secretary.

Nebraska

The Nebraska railway commission has defined its powers and limitations in the matter of control of high voltage electric transmission lines, in a syllabus and order just handed down on the application of the Blue River Power Company, of Seward.

Up to the present time, electric generating companies have clashed with telephone companies over dangerous wire crossings, paralleling of lines which demoralizes telephone service unless the telephone lines are frequently transposed, and the question of who shall pay the expenses of changes.

The commission makes it plain that except in one case, it has no power to assess expense, but that it can order any changes deemed necessary for the good of the service or the safety of the public. The costs must be settled between the companies or taken to the courts.

The condition on which the cost can be assessed is when two telephone lines run on each side of a public highway, and a transmission line is contemplated. Then the commission says it can order one phone line moved over and adjust the expenses itself.

The telephone companies interested in the case are the Lincoln Telephone & Telegraph Company, the Western Union Telegraph Company, and a number of mutual companies. By agreement, both sides have settled on the Iowa transmission line rules, in the cost of construction, operation and in general expenses.

Accordingly, the commission has issued orders, to become effective December 1, allowing transmission lines to be built from Seward to Pleasant Dale and Utica, to Valparaiso, Friend to Cordova and Fairmont to York, and from Pleasant Dale to the farmers' elevator south.

In the proposed extension of the line from Seward to Valparaiso by way of Dwight, the telephone companies were able to agree with the generating companies for the Valparaiso-Dwight line.

The state railway commission has authorized the Curtis Telephone company to increase its rate of business telephones from $1.25 a month to $1.75 a month, a discount of 25 cents to be allowed if rental is paid on or before the 20th of the month in which it is due. The company originally asked leave to increase the business rate to $2 a month and to increase residence rates from $1.25 a month to $1.50 a month, with a discount for prompt payment. Objections were filed to the increase in residence rates and the company modified its complaint by withdrawing its request for higher residence rates and cut down the business rate with a discount.

The Curtis Telephone Company, operates only in Curtis and owns no farm lines. It switches farm lines and there are about 435 patrons on the entire system. Of these about 180 reside in Curtis. The Moorefield Farm & Ranch Telephone Company sold its Curtis exchange in March to the Curtis company for $1,200.

The property invested in the Curtis Telephone Company's plant in March was $3,365 not including the purchased exchange. Some of the property will not be used for two or three years. The railway commission took $4,000 as a reasonable amount for the investment.

The company's annual rentals amount to $2,560, its expenses are $2,143 and it allowed $37 interest on its debt, making a net income of $380 a year, according to a report of the company. The commission uses $4,000 as the amount of the investment and figures the net operating income at $176.58 for interest and dividends. None of the officers of the company receive pay for their services. The commission figures that the increase in revenue caused by the new rate on business telephones, considering the discount for prompt payment, will be only $150 a year, and that the increase asked for is reasonable.

North Dakota

An increase in telephone rates in Bismarck, requested by the North Dakota Telephone Company, is granted by an order of the state rail commission, the rates to be effective December 1.

The change granted increases one-party business telephones to $3.25 a month, and two-party business telephones to $2.75 a month, a net increase of 25 cents a month. Eighty-two per cent of the patrons approved the increase.

Construction of the conduit system of handling the lines, causing greater expense, was pleaded by the telephone company as the basis for the rate increase.

Ohio

A reproductive cost of $6,228,140, and a "present" value of $5,781,905 on April 1, 1914, are claimed by the Cuyahoga Telephone Company, in its valuation filed with the state public utilities commission.

The appraisal was ordered by the commission in April, 1914.

It is expected the commission will announce a tentative valuation in a few weeks. Unless protests are made within 30 days after that the tentative valuation becomes the basis of rate-making.

The items of the valuation are:

Rights of way and land: Reproductive value $692,492; present value the same.

Buildings, equipment, lines, furniture, poles, material and supplies: Reproductive value $4,153,743; present value $3,755,618.

Preliminary costs, cost of establishing business, and working capital (exclusive of material and supplies): Reproductive value $1,083,500; present value the same.

Proportion of electric building not occupied by telephone company: Reproductive value $298,403; present value $250,294.

State utilities commission authorized the Bergholz Telephone Company, operating in Stark, Jefferson and Columbiana counties, to purchase from the Central District Telephone Company lines in the exchange territory of Carrollton and Malvern, and to interchange service. Rates were fixed by the commission ranging from $8 for switching to $30 a year for single business telephones. Single residence telephones were fixed at $21. The Bergholz company was also authorized to sell $800 common stock in order to build a copper circuit from Malvern to Osnaburg and to pay the Central company $48.00 in promissory notes in connection with the transfer of property.

B. T. Calloway, owner of the Beach City Telephone Company, of Beach City, has asked the state utilities commission to authorize him to sell the property to the Brewster Telephone Company.

With officers of both companies asking for approval of the transaction, an agreement for the sale of Ashtabula Telephone Company to the Ashtabula Service Telephone Company, for $350,000, together with an application for an increase of capital stock of the latter company to $500,000, was filed with the public utilities commission. January 1, 1917, is the date set for the transfer of the property. The commission heard the application November 23. Approval granted.

The Ohio State Telephone Company asked authority of state utilities commisisoners to issue $2,000,000 of its authorized preferred stock and at the same time outlined $3,447,447 proposed extensions and improvements to be made to its plants in Ohio.

Of the total to be spent $348,456 will go for improvements in Columbus, $42,679 in Franklin county, $190,846 in Dayton, $6,312 in Montgomery county, $34,816 in Washington C. H., $112,550 in Lancaster, $703,615 in Cleveland, $587,952 in Toledo, $216,276 in Akron and $13,480 in Findlay.

New rate schedules established by the Ohio State Telephone Company will be protested before the state public utilities commission, by the City of Cleveland council committee on telephones and telegraphs.

Assistant Director of Law Wickham of Cleveland was directed to prepare a resolution making a formal protest against the new rate, which went into effect recently. The resolution will be introduced at the coming council meeting by Councilman Sulzmann.

Oregon

On account of the Orgeon supreme court holding that the circuit courts had no jurisdiction over the regulation of public service corporations because the power of regulation has been delegated to the public service commission by the voters of the state, and because the supreme court held that the interposition of the court of equity to grant an injunctive relief was not warranted, the case of the First National bank of Albany against the Pacific Telephone and Telegraph Company and the Home Telephone and Telegraph Company, which was dismissed by the judge of the circuit court at Albany, will come before the public service commission on November 27 in this city at 10:30 o'clock.

According to the supreme court decision the bank of Albany has a privately owned and operated telephone system in its building and that it desired to have this system connected with the Pacific telephone system so that communication could be had from any office in the bank with any office in the city. A connection was made by the bank and the suit was brought in the circuit court to permanently enjoin the company from disconnecting, interferring with, or changing it. The connection was made, it is asserted, without the knowledge or consent of the telephone company, with one of the trunk lines of the Pacific company which connected with a booth in the bank building.

When the suit was dismissed in the circuit court at Albany it was appealed to the supreme court, which, because of the law which provides that the public service commission regulate public service corporations, affirmed the judgment of the lower court. The case is believed to be quite important as numerous other institutions have like telephone systems.

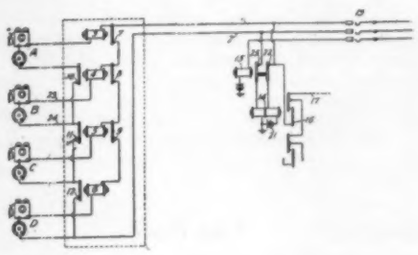
Telephone Patents Issued Recently

A Brief Digest of those Current Specifications Most Interesting to Telephone Men

BY DAVID S. HULFISH

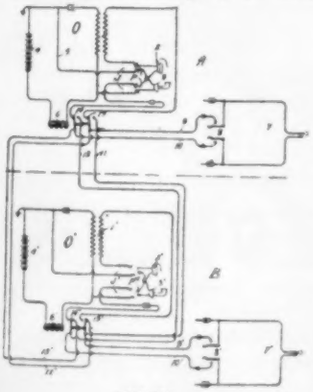
NO. 1,199,156. Automatic Trunking System. Issued to W. L. Campbell, assignor to Automatic Electric Company, Chicago, Ill. (Application filed May 12, 1908.) Trunks lead from jacks to selector switches for selecting trunks which lead farther; the selector switches pre-select an idle trunk and upon insertion of a plug the idle trunk is seized and another trunk is pre-selected for the next plug which may be inserted.

1,199,158. Call-Distributing System. Issued to H. P. Clausen, assignor to Western Electric Company, Inc., New York, N. Y. The test relay of a line finder is released when the calling line is found, the release being effected by placing a second winding of the test relay in series with the first or actuating winding.



1,199,783.

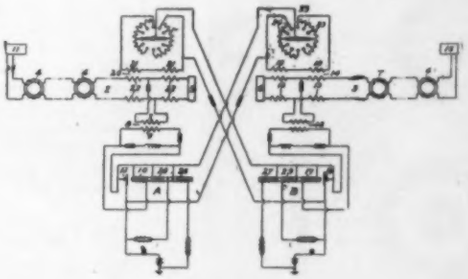
1,199,317. Semi-Automatic Trunking System. Issued to J. A. Taggart, assignor to Stromberg-Carlson Telephone Manufacturing Company, Rochester, N. Y. The manual operator plugs into a jack leading to an automatic selecting switch and then presses an order-wire key; the key then causes the automatic switch to select a group of trunks leading to the exchange indicated by the key and then to select an idle trunk in the group.



1,200,277.

1,199,748. Automatic and Manual Combined Exchange. Issued to T. G. Martin, assignor to Automatic Electric Company, Chicago, Ill. (Application filed February 7, 1908.) A manual-telephone line may be called by a manual operator from jacks, or may be called by an automatic telephone through connectors; the manual operator may call manual lines directly through jacks or may reach through jacks to automatic connectors to call automatic lines. The claims cover combinations of these elements without restriction as to details of apparatus used.

1,199,783. Lockout Circuit. Issued to O. D. M. Guthe, assignor to Western Electric Company, Inc., New York, N. Y. On a party line, a relay at each station opens the circuit of all other stations. There are three wires between stations.

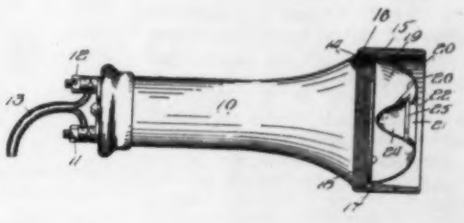


1,200,082.

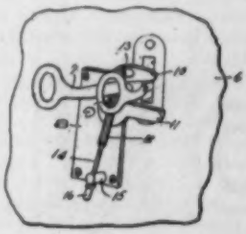
1,199,788. Cord Circuit. Issued to E. E. Hinrichsen, assignor to Western Electric Company, Inc., New York, N. Y. A cord pair having twelve relays holds the talking conductors normally open; no ringing or listening keys are used and a pair of lamps signal the condition of the connection, all the operations being effected by the relays.

1,200,081. Re-Call Signaling System. Issued to H. P. Clausen, assignor to Western Electric Company, Inc., New York, N. Y. When the calling subscriber flashes his lamp by working the hook, a relay automatically disconnects the called line and a flashing commutator continues the flashing of the signal lamp until the operator has given the line attention.

1,200,471.

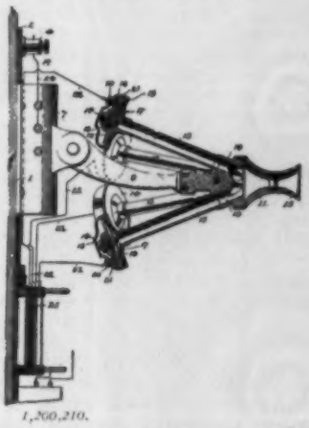


1,200,815.



1,201,083.

1,200,082. Repeater System. Issued to E. H. Colpitts, assignor to Western Electric Company, Inc., New York, N. Y. The moving parts of the repeating mechanical devices are adjusted to have a natural frequency higher than any voice frequency.



1,200,210.

1,200,095. Stepper Device for Party Line. Issued to J. C. Field, assignor to Western Electric Company, Inc., New York, N. Y. Alternating current is used for stepping the ratchet of the device, and one or the other of two pairs of local contacts may be closed by selecting the polarity with which the alterating selecting current begins to operate.

1,200,156. Call-Sending System. Issued to J. L. Wright, assignor to J. R. Garfield, trustee, Cleveland, Ohio. A key-bank call sender sends impulses to a selecting switch and to a detector switch, the detector switch operating to cut off the impulses from the selecting switch when the two switches have reached the position indicated by a depressed button in the key bank.

1,200,210. Multiple Transmitter. Issued to F. H. Millener, Omaha, Neb. A single mouthpiece has sound tubes leading to a plurality of sound diaphragms having carbon buttons. Designed particularly for wireless work where large currents are required.

1,200,277. Circuits for Operator's Equipments. Issued to R. I. Utter, assignor to Kellogg Switchboard & Supply Company, Chicago, Ill. When an operator removes her head gear by withdrawal of its plug from the operator's jack, her cord pairs and listening keys are switched automatically to the head gear of an adjacent operator's position.

1,200,470 and 1,200,471. Thermic Receiver. P. de Lange and R. A. B. van Lynden, assignor to Naamlooze, Etc., Utrecht, Netherlands. The receiver case contains loops of heating wires confined to a small chamber connecting with the ear holes, the chamber being turned to the desired frequency. Especially adapted for wireless telegraph receiving.

1,200,788. Identifying Device. Issued to S. B. Williams, Jr., assignor to Western Electric Company, Inc., New York, N. Y. In a call-distributing system, lines of different classes of service are distributed to all operators. Each line when passed to an operator has placed upon its conductors a series of impulses which identifies it as a coin-box line, meter line, etc., and the operator has an indicator responsive to the impulses.

1,200,811. Call-Sender System. Issued to E. E. Clement, assignor to J. R. Garfield, trustee, Cleveland, Ohio. A stepping magnet in the telephone call sender and a stepping magnet in the central office selecting switch are ararnged in series and both the selective switch and the call sender step in unison until both have reached the position indicated by a selective dial upon the call sender.

1,200,812. Semi-Automatic System. Issued to E. E. Clement, assignor to J. R. Garfield, trustee, Cleveland, Ohio. In a semi-automatic system, the subscriber at a branch exchange may call over an order circuit, giving his number and the number to be called; the central operator then picks up the calling line over one trunk and the called line over another trunk, the two lines being then connected by automatic switches and relays.

1,200,815. Sound Amplifier. Issued to W. H. Cotton, assignor to F. A. Watkins, Chicago, Ill. An earpiece for telephone receivers, of the form shown in the illustration accompanying.

1,200,829. Ringing Circuit for Automatic Exchange. Issued to C. L. Goodrum, assignor to Western Electric Company, Inc., New York, N. Y. In an exchange where the call-sender is pulled but once, the ringing relay is connected to the end of the signal impulses and is removed after a slow relay releases its armature.

1,200,841. Alarm System. Issued to H. H. Ide, assignor to Kellogg Switchboard & Supply Company, Chicago, Ill. An off-normal automatic switch closes a circuit through a thermostat and when the thermostat gets hot enough it closes an alarm circuit.

1,200,856. Call-Sender. Issued to J. A. Kropp, assignor to Western Electric Company, Inc., New York, N. Y. Power is supplied (or stored) by a mainspring which drives an interrupter, the interrupter being permitted to send impulses under control of a handle. The idea does not seem so recent as the date of filing (September 26, 1914,) and the claims would indicate.

1,201,083. Attachment. Issued to C. O. Oldfield, Canton, Kansas. A spring-controlled latch will permit the hook lever to rise to its full height and close both line and local circuits, or will permit the hook lever to rise only far enough to close the line circuit, so that the telephone user may listen upon the line without closing his transmitter circuit, thus saving battery power and holding the line silent while listening.

1,201,455. Exchange System. Issued to C. L. Goodrum, assignor to Western Electric Company, Inc., New York, N. Y. Where a subscriber has a changed number, the jack of the old number is connected to an automatic switch which will pass the connection through to the new number whenever the old-number jack is used for a call.

1,201,569. Automatic System. Issued to E. D. Fales, assignor to Automatic Electric Company, Chicago, Ill. All the telephone lines of the system are normally connected to a common trunk line, each telephone removing itself from that line when making a call or when called. The patent carries sixty-two claims and the date of filing is early, May 7, 1907.

1,201,600. Trunking System. Issued to T. G. Martin, assignor to Automatic Electric Company, Chicago, Ill. (Application filed September 28, 1907.) In a private branch exchange, the selector acts as a connector except in the top level, where additional switch springs convert it into a selector for selecting an idle trunk to the central office, and a repeating circuit also becomes operative for repeating call-sender impulses to the trunk.

1,201,797. Reverting-Test System. Issued to S. A. Beyland, assignor to Stromberg-Carlson Telephone Manufacturing Company, Rochester, N. Y. (Application filed January 3, 1911.) A testing-tone current of distinctive characteristics is formed when the line tested is a party line and is the same line which is calling and which is connected upon the answering plug of the pair.

1,202,275. Register for Automatic Switches. Issued to A. H. Dyson, assignor to Western Electric Company, Inc., New York, N. Y. A step-by-step registering switch is stepped from normal position by control of an automatic call-sender; central office apparatus then acts to restore the register step by step, and at each step of return of the register a central office switch is advanced, so that ultimately the position of the switch corresponds to the indicating position of the register.

1,202,281. Test System. Issued to C. L. Goodrum, assignor to Western Electric Company, Inc., New York, N. Y. Specific circuits are described for an arrangement for advancing a power-driven switch over busy lines in selecting the first idle line of a group.

1,202,367. Reverting Test. Issued to H. D. Currier, assignor to Kellogg Switchboard and Supply Company, Chicago, Ill. Specific circuits for a reverting-test system to give a distinctive tone.

1,202,555. Code Ringing System. Issued to T. G. Martin, assignor to Automatic Electric Company, Chicago, Ill. The code ring for a party-line station is determined by the number called in the automatic exchange, a commutator for ringing the code signal is connected to the selecting switches, and an automatic ringing-starter prevents the device from beginning the code ring in the middle of a code.

Detroit Manager Scores Flat Rate

"We can't pay a milkman $5 a month and expect him to deliver all the milk we may need at the flat rate," said G. M. Welch, general manager of the Michigan State Telephone Company, before members of the American Institute of Electrical Engineers, at Detroit. "Neither should the people of Detroit expect a telephone company to render all the service they require at a flat rate. Flat rates for all commodities are passing away."

Charts were drafted showing that with increases in operating expenses, including three wage increases, the last of which takes effect December 1, a fair return could not be made on the invested money. Mr. Welch said the telephone traffic a customer a day was greater in Detroit than in any other city.

"There is a smaller per cent of working girls in Detroit than any other city. The Michigan State Telephone Company is 800 girls behind the number employed six months ago."

The Tone of Voice

Switchboard operators of the Cleveland Telephone Company read your character by the inflection of your voice when you give them numbers. They're character analysts. But, like many character analysts, they differ in their conclusions.

"The man with the gruff bass voice is nearly always polite," says Miss Lillian Mahoney. It's the man with the thin high voice I find nervous and hard to please."

Miss Mahoney is supervisor of the information bureau.

"I think women are the more polite over the telephone," says Miss Regina Kalleher. "Men with gruff voices are gruff in manner. Those with piping voices are better natured."

"To me a woman always is nervous, irritable and hard to suit," says Miss Marion McAdams.

Of Interest to the Trade

What the Telephone and Accessory Manufacturers Are Doing to Advance the Art

Kellogg's Common Battery Bulletin

A new bulletin on common battery telephones has just been issued by the Kellogg Switchboard & Supply Company.

The front cover contains a very attractive reproduction of the company's standard desk stand, illustrating both front and rear views. The bulletin is printed on the best grade of enameled paper, which shows all the cuts to the best advantage.

It contains detailed description and illustrations of the common battery induction coil-condenser type telephones, which are declared to produce a wonderful talking circuit. These telephones have been tested again and again in actual service and are now used exclusively by many large Independent exchanges.

A cross section view of the No. 97 desk stand is illustrated, clearly showing the many points of superiority in design and construction.

The common battery desk stand boxes are interchangeable. They can be used with a straight line, biased, 1st, 2nd, 3rd, or 4th party ringer; this feature makes these sets very desirable as they are money savers when changes are wanted.

This bulletin should be in the hands of every telephone man who is interested in the improvement of modern telephone equipment. The Kellogg Company will gladly forward a copy upon request.

The Kellogg C. B. Bulletin.

The Leich Electric Company, New Name

The Cracraft, Leich Electric Company will now and hereafter be known as the Leich Electric Company.

The only change made is in the corporate name, as the stockholdings remain practically the same and the company will be under the same management as heretofore.

The Stromberg Carlson Apparatus Cmmittee

The accompanying illustration shows the Apparatus Committee of the Stromberg-Carlson organization at work in the executive offices at Rochester, N. Y.

This committee is composed of men that have been connected with the Stromberg-Carlson Company for many years and also those formerly with the Garford Manufacturing Company at Elyria, Ohio. In order from left to right they are, A. M. Haubrich, E. G. Eidam, Eugene A. Reinke, W. Roy McCanne, Rev. H. Manson, George A. Scoville, and Sidney A. Beyland. These men get together for a steady two-day session every other week and decide upon the standardization and improvement of both Stromberg-Carlson and Garford products. The objective point of their labors is to produce a complete line of apparatus that will include the best features of the various parts manufactured by both companies prior to the purchase of the Garford Manufacturing Company's telephone business and telephone assets.

Stromberg-Carlson Apparatus Committee at Work.

The efforts of this committee are beginning to show results. Many new and improved pieces of equipment have been completed and are now undergoing the usual operating tests in the company's electrical and mechanical laboratories, to make doubly sure that they are flawless before announcing them to the telephone buying public.

A number of affidavits and other documents were read to the court. At the conclusion of the hearing Judge Comstock made an order permitting the electric company to turn on current between the hours of five o'clock in the afternoon and seven o'clock in the morning, on condition that the electric company furnish a bond in the sum of $10,000 to pay any sum which it may be hereafter determined in court it is liable for, if any.

B. L. Bullman, general manager of the Washington Telephone Company, told the members of the council of the Chamber of Commerce of Marietta, Ohio, that the merger of his company with the Bell probably would be effected by January 1.

An Improved Insulation

A new form of electrical insulation, of wide and general interest and application throughout the electrical industry, is now being placed on the market by the Diamond State Fibre Company, Bridgeport, Pennsylvania. This product is called Condensite-Cellulac.

This company had developed and patented the process for manufacturing on a commercial scale this new form of insulating material which is entirely different in physical and chemcial characteristics from any other form of fiber, hard rubber, mica or synthetic insulation now available. It is not merely built up of coated paper in laminations, nor is it a coated or veneered fibre, but is a product which is homogeneous throughout. It combines in great part the stable physical and chemical properties and high dielectric resistance of the well-known Condensite molding preparation of the Condensite Company of America, which is employed in its manufacture, and the good qualities of the best grade of vulcanized fibre.

Condensite-Cellulac is claimed to be permanently anhydrous and non-hygroscopic, and impervious to the action of oil or ordinary acids or solvents. It is infusible and is not affected by the action of heat within the range of temperature ordinarily encountered and hence cannot break down setting free substances which may attack and corrode conductors or connections. It is not fragile like some other insulating materials, but is very tough and will stand considerable vibration or shock.

On account of these properties a vast field is opened up for the use of this newly developed insulation—a field which apparently could not be entered by other existing forms of fibre insulation due to their inherent capacity for absorbing moisture.

The application to service of this material in locations exposed to the weather is not only a possibility, but will undoubtedly comprise a considerable part of its field of applications, as it is strictly waterproof. It may also be used advantageously in apparatus which is to operate under unfavorable conditions of moisture, or subject to splashing with oil, such as insulation for automobile ignition systems, or where exhaust steam is used in industrial processes.

Condensite-Cellulac is furnished to the trade in merchantable shapes—sheets, rods, tubes, etc., and is readily machined. It may be formed into very thin sheets (.015-inch or less) with remarkable accuracy to gauge, thereby furnishing an excellent diaphragm material. It is also supplied shaped to customers' specifications. The work as thus supplied is ready for use, having been hardened and made insoluble and infusible by the application of heat.

A unique feature of Condensite-Cellulac of considerable general interest is the possibility of supplying it in soft, uncured state, permitting of its being hardened in the place where it is to be used and thereby formed to fit in spaces or locations with an accuracy not otherwise possible. This, for instance, gaskets for hot lines, steam, hot water, compressed air, etc., may be accurately fitted to rough flanges and cured in place by the heat of the line.

Standard T-L Switch Type Artificial Cable

The T-L standard switch type artificial cable was designed particularly for companies desiring to make the usual transmission tests, who do not feel that they care to go to the expense of the American Telephone & Telegraph Company's standard.

The switches are built underneath the hard rubber mounting plate, and are operated by knobs on the top, which are marked to designate the values of the cable cut in by each switch. This is a special circular switch, designed by the manufacturers, is easy to operate and positive in its action. They reduced the cost by eliminating the expense of hand labor on the many switches mounted on the top of the standard cable, and the higher accuracy of adjustment, which is not necessary for ordinary work.

This type of cable is subdivided in exactly the same values as the standard cable, and has all of the electrical constants the same.

The accuracy of adjustment of the resistance coils is one-fourth of one per cent and the condensers are accurate to one per cent. These accuracies are ample for ordinary commercial testing, and the manufacturer strongly recommends this type of cable where transmission tests are to be made. The company also states that it can supply this switch construction in either artificial cable or artificial aerial lines, from a fraction of a mile in the cable up to 600 miles in the standard aerial line, and will gladly quote prices upon receipt of specifications.

The instrument is being put upon the market by the Thompson-Levering Company of Philadelphia, Pa., manufacturers of standard telephone testing equipment.

Kellogg at the Illinois Convention

The Illinois State Convention held at Springfield, Illinois, November 15, 16, 17, 1916, was very largely attended, as was the Kellogg Company's exhibit.

The exhibit of the Kellogg Company was unusually attractive. It demonstrated the advantages of its instantaneous recall switchboard and also the new low key, shelf type magneto switchboard.

The demonstration of the No. 1 direct current electric light converter attracted considerable attention. this being new equipment recently put on the market by the Kellogg Company, used for power ringing by direct connection with an electric light circuit.

The company's new low shelf P. B. X. and cordless P. B. X. switchboards, its universal switchboard, and also a large quantity of miscellaneous apparatus were also on display.

An operators' and chief operators' school was held every day, conducted by W. S. Vivian of the United States Independent Telephone Association, A. J. Shands of the Kinloch Telephone Company, and Carl Doolittle of the Kinloch Telephone Company of Terre Haute, Indiana, and proved very successful. The switchboards used were miniature boards which were furnished especially for this purpose by the Kellogg Company.

During the noon hour a large number of operators could be found gathered around and examining the Kellogg instantaneous recall switchboard.

A. J. Carter, sales manager, F. L. Eldridge, J. B. Haley and C. M. Bowling, sales representatives of the Kellogg Company were present.

New Chicago Warehouse for Ecco

The Electric Cable Company announces the opening of its Chicago warehouse with a complete stock of "Ecco" high grade insulated wires and cables, and is now prepared to make prompt shipments of all sizes from this point.

Lexington Board Awarded to Stromberg

The Stromberg-Carlson Telephone Manufacturing Company announces that it has been awarded a contract for a combined toll recording, supervisor's, and observation switchboard by the Fayette Home Telephone Company of Lexington, Kentucky.

This board consists of three two-position, five panel, low type steel framework Garford sections with dark mahogany finish. The first three positions will be arranged for recording purposes. The fourth position will not be equipped for present operation. The fifth and sixth positions will be equipped for supervisor's and observation purposes.

An eighteen-inch cable panel will be fitted at the initial end of the board and the sections throughout will be provided with lift-out doors and panels, these to be placed beneath the keyshelves and in the rear of the sections. The lower front rail is provided with formica kick mats, otherwise the plug shelves and keyboard are covered and finished in dull black.

Echoes of the Dean-Garford Sale

Stockholders in the Garford Manufacturing Company, which took over the assets and good will of the old Dean Electric Company, have been notified that they will receive one share of common stock of the new company, in exchange for each five shares of preferred stock in the Dean company.

The litigation prosecuted against the Dean company by the Kellogg Switchboard and Supply Company has been disposed of and the stock transfer can now be completed, according to the plan decided upon two years ago.

The common stock, which is to replace the preferred stock, has been deposited with the Savings Deposit Bank and Trust Company of Elyria, where it will be exchanged for the old stock.

The common stock of the Garford Manufacturing Company is tendered in full payment for the Dean company preferred stock and must be accepted as such, according to the notice mailed to the stockholders under date of November 11.

The transfer of stock is authorized by the protective committee selected to look after the interests of the holders of the Dean Electric Company preferred stock, the plan now being carried into effect having been submitted to and accepted by the stockholders in the old company over two years ago.

The manufacture of telephones and telephone equipment, formerly conducted by the Dean company, has been abandoned by the new company, which is now almost exclusively engaged in the manufacture of talking machine motors.

The Original Candle Lamp

The M. W. Dunton Company, Providence, R. I., calls our attention to a handy soldering torch or candle lamp described in the company's book "Soldering Kinks." It is kink No. 4, and appears on page 18 of the book. The lamp design was contributed to the company several years ago by H. E. Amann, Columbus, Ohio, and is quite similar to one described as a new device in TELEPHONE ENGINEER last month.

Incidentally, "Soldering Kinks," which is sold by the M. W. Dunton Company for 25 cents, is one of the most valuable books a telephone man can own.

Price Changes for American's Catalog No. 50

American Electric Company's last piece of literature is a price revision list applying to Catalog No. 50. As it cancels all previous lists, it should be in the hands of all who have the catalog. Issuing the new list was made necessary by the decided upward tendency of material costs, which frequently tend to place a deficit upon old prices. The increase, however, in most cases is slight, the company preferring to figure very closely and reserve the right to make further changes if conditions force them, and not until then.

A Treatise on Conduit

The National Fire-Proofing Company's latest book on McRoy lamp conduits is not only a work of art and a collection of interesting type and pictures, but it is practically a standard treatise on the use of vitrified conduit for underground wires. As this particular part of telephone practice is becoming more urgent every day, it follows that every telephone man should have a copy of the book. Further description here is made unnecessary by the fact that the work is available to all.

Changes in Western Electric District Manager

F. B. Gleason, formerly in charge of the Western Electric Company's business in the Far East, with headquarters at Tokio, Japan, has been appointed manager of the southern district of the Western Electric Company, with headquarters at Atlanta, Georgia. He will succeed E. J. Wallis, who, on January 1, will take up his new work as manager of the Pacific Coast district, with headquarters at San Francisco. Mr. Wallis will succeed F. H. Leggett, who, after three years on the coast, returns to the company's executive offices at 195 Broadway, New York City.

Lots of Telephones in Kansas

There is a telephone for every six persons in Kansas. The public utilities commission gave out the telephone statistics of the state as shown by the annual reports of the various companies. There are 928 different exchanges operated by about 600 different firms, individuals and corporations in the state. These exchanges have 137,176 miles of wire and 281,549 separate subscribers, giving one telephone for every 5.94 persons in the state. That is a telephone for almost every home in Kansas and is said to be the highest per capita of any state.

Loud Speakers for Forest Service

Experiments are being conducted in connection with the telephone service in the Jefferson national forest, Montana. The plan is, providing the experiments are successful, to install giant horns in connection with the telephone service at high points on the mountains and at ranger stations for the purpose of giving trouble calls to the rangers.

Stromberg-Carlson's Bulletin No. 1017 on Intercommunicating Telephone Systems is very interesting to the increasing number of people who deal with such systems.

Music and News Transmitted by Wireless

War bulletins, and important world happenings, now and then interspersed in a nightly musical program from the air, without wires and for public benefit in the office, aboard ship or at home, is the new era of wireless telephony now being demonstrated by Dr. Lee de Forest, at the DeForest radio experimental laboratories at Highbridge, New York, after a series of experiments in wireless telephony covering the greater part of nine years.

Public announcement of this new wireless achievement was made recently in the form of "an invitation-to-listen" sent out by the high powered oscillating audion transmitter at the DeForest laboratories. The notice itself was novel, first in the sense that it was entirely "wireless," and again, in being addressed to the several thousand amateur wireless operators within a hearing radious of New York, it foretells, according to the inventor of the audion lamp, "the coming of the world's first regular spoken, or wireless telephone newspaper."

Among the musical numbers on the nightly program are selections from Wagnerian operas and from Puccini, popular dance music like the Kangaroo Hop, sentimental songs including "Come Back to Erin," as well as Hawaiian medleys from the Toots Paka Hawaiian Company, the Native of Vienna Waltz by Strauss and the 1812 Overture by Tschaikowsky. In point of clearness, the xylophone and the accordion are among the best instruments for wireless transmission, although the brass band, and the human voice, especially if soprano, oftentimes are equally clear to all the listening amateur stations.

To transmit the human voice by wireless telephone, the speaker, or operator, talks into an ordinary microphone, like those used on the regular telephone apparatus in the city service. In the case of a musical selection the microphone is placed inside the cabinet of a graphophone, where it will get the full volume of sound, and when the record is made to play, the musical notes, like the vibrations of the human voice, are taken by wire to a coil where they are transformed into high frequency waves of high voltage. Thus they are sent out, by the oscillating audion, for public enjoyment. At the receiving end, the music or spoken word is heard by means of the regular wireless ear pieces, which are like those used by the operators at telephone exchanges.

Co-operating with Dr. DeForest in the development of the musical part of the program is Dr. C. M. Goldstein, scientific director of research for the Columbia Graphophone Company, who has taken this modern means of demonstrating the new Columbia records.

"It was hardly more than a year ago," remarked Dr. DeForest the other day, "when the public heard of the Arlington station wireless telephone test, which recorded by means of the audion lamp, the transmission of the human voice from Washington, D. C., to Honolulu, without the use of wires. Experimental work on such a scale is highly interesting from the point of view of a wireless stunt. It is only the practical application of this work, however, that directly concerns the public, and the possibilities in the direction are clearly shown, we believe, in the wireless concerts we are now sending out at our laboratories. Personally I can see no reason why the wireless telephone transmission of news in the near future will not be a regular means of communication, and a very valuable one too in supplementing by bulletin in the various editions issued by the metropolitan newspapers. All that is needed is the news, and a comparatively few well located high power stations capable of covering the entire country. Already we have in the United States I should say at least 200,000 amateur wireless outfits waiting to receive news and music by the wireless telephone."

In addition to the scientific advance made by the wireless telephone, Dr. DeForest further calls attention to the novelty of a bulletin, or musical wireless journal: "The publishers of such a news service will be the only ones in the world, I fancy, who are not affected in one way or another by the higher cost of paper. We are certainly the first to make use of the oscillating audion as a printing press, when we speak our news, or as an organ, when we play our phonograph concerts. In short, this is pioneer service in producing news and music from the electric bulb. This news and music has the further great advantage that it can be delivered instantly and without the nerve racking cry of extra, in the quiet of your home, without opening the door, or even ringing your bell."

Electric Power Club Meeting

The seventh semi-annual meeting of the Electric Power Club was held at Hot Springs, Virginia, on November 15 to 18. About seventy men were present representing thirty manufacturers of motors, generators, transformers and industrial control apparatus.

The president's address outlined briefly some of the things accomplished by the club during the past six months. He said, in part: "True cost accounting is the financial heart of the business corporations of this country. It is a guarantee to the stockholders. It is a guarantee of credit risks. It is a guarantee against receiverships. It is a stabilizer of uniform prices. The primary cause of price cutting is the lack of knowledge of one's true costs." The value of associations were emphasized in the words, "An industry as a whole cannot work to its fullest benefit without co-operation, and interchange of ideas of the people of the industry; hence we find the necessity of associations as means through which experineces may be discussed, investigations made, and unity of action taken. An association for each industry is essential to the economic, moral and financial success of such industry."

The various technical committees brought in reports of their work and many of the recommendations they made were adopted.

One of the most important things adopted was standard sizes and limits for carbon brushes. A large number of rules covering performance specifications for motors with 50, 55, 70 and 75 degree temperature rise rating were approved and will be published in the next edition of the standardization rules, which will be printed in two or three months.

The club has always advocated co-operation between the various associations representing the electrical industry, in order to prevent the adoption of conflicting standards. This idea was carried still further by the appointment of a conference committee to meet with like committees of other associations.

The club was intensely interested in an address made by M. W. Alexander on "Educational Courses for Apprentices and Workmen."

At the last meeting of the board of directors of the Citizens Telephone Company of Grand Rapids, Mich., a mortgage for $3,000,000, authorized by the company, was executed. This mortgage is to be used as a basis for a bond issue. Of the authorized amount $720,000 will be used at present.

Brevities of the Business

The Activities of the Whole Telephone Field Told in Short Paragraphs

PERSONAL NOTES.

G. L. Smith, formerly manager for the Southern Bell Telephone & Telegraph company at Albany, Alabama, has been transferred to Atlanta, where he will be chief clerk in the office of J. S. Bridger, division superintendent of traffic for the American Telephone & Telegraph company.

Ben B. Early resigned on November 1 as manager of the Shelbyville exchange of the Central Union Telephone company, Indiana, becoming manager of the Clark Storage company in Anderson.

John A. Barrett, inventor and electrical engineer, associated for many years with the American Telephone & Telegraph company, died at his home in Maplewood, New Jersey, after a long illness. Mr. Barrett was one of the best known engineers in telephone and telegraph circles in the world. He was born in Woodstock, Vt., fifty-eight years ago. From 1882 to 1884 he was associated with the Western Union Electric company, and founded the firm of Barrett Bros. In 1886 he was employed by the A. T. & T. company to solve the "cross talks" difficulty on the first long distance phone from New York to Philadelphia. He invented the transposition system, which remedied the existing conditions and which is now used the world over. Mr. Barrett's next business venture was the organizing of the Elektron company, of which he was first president, and which put forth the first storage battery automobile. He is credited with being the first man to use paper insulation. Mr. Barret was a member of the D. W. E., American Society of Engineers and the University Club of Denver. He is survived by a widow and three daughters.

C. A. Coates has resigned as manager of the Dundee exchange of the Interstate Telephone company, Illinois, taking a similar position with a telephone company in Grand Ridge.

Following thirty-two and one-half years of continuous service for the Michigan State Telephone company, W. H. Badour has retired and will go on the pension list.

L. E. Schmidt, formerly commercial manager of the Iowa Telephone company in Clarinda, now wire chief at Red Oak, met with an accident when his machine overturned. He was slightly bruised.

W. G. Seath, manager of the Missouri & Kansas Telephone company, who has been doing special work for the company at Sabetha, Kansas, has returned to Springfield, Mo., and assumed charge of the office. Mr. Seath has been in Kansas for the past five months.

George Cook, plant chief at the Alliance, Ohio, exchange of the Bell Telephone, company, is seriously ill having underwent an operation for appendicitis a few weeks ago.

C. W. Lockwood, manager of the Bell interests at Otsego, Michigan, has been named as the successor of W. H. Badour, retired, as manager of the Dowagiac exchange.

Charles S. Norton, for years secretary and treasurer of the Indianapolis Telephone company, Indianapolis, Indiana, has resigned to accept a position with the receivers of the Central Union Telephone company. Mr. Norton was connected with the independent telephone movement from the beginning, and was the organizer and president of the State Association for several years.

R. L. Harris, who has been district commercial manager of the Nebraska Telephone company for the past five years, with headquarters at Deadwood, has been transferred to Grand Island.

E. M. Boynton died at Meadville, Pa., October 26, at the age of 66 years. Mr. Boynton entered the service of the Western Union Telegraph company in 1868 at Cleveland, Ohio, and in 1870 was transferred to Meadville as local manager for the Western Union company. In 1890 he entered the service of the Central District Telegraph company and served as district manager and as general superintendent of construction. Mr. Boynton retired from active service in 1913.

William CaJune, an employe of the Northwestern Telephone company at Mankato, Minn., died from injuries received by falling from a telephone pole.

F. H. Cornell has resigned as secretary and treasurer of the Lawn Ridge Telephone company, Illinois, and W. R. Peck of Edelstein has been chosen as his successor.

J. E. Smithson, formerly manager of the White Salmon, Washington, telephone system, has been elected president of the Oregon-Washington Telephone Company, composed of the amalgamation of the companies operating the Hood River, White Salmon and Goldendale, Washington, exchanges. Mr. Smithson succeeds W. N. Winter, who was recently made president-manager of the Puget Sound Telephone Company.

Daniel Leet Wilson, one of the oldest and best known financiers of the Pittsburg district, and one of the incorporators of the Bell Telephone Company, died November 9 at the home of his daughter, Mrs. Thomas Patterson, School House Hill, Shields. At the time of his death he was vice-president and a director of the Central District Telephone Company and a director of the Bell Telephone Company of Pittsburgh, Pa.

W. G. Cherry, of Chciago, is now acting manager of the Automatic Home Telephone Company of Pontiac, Illinois.

Hugo Johnson, manager of the Sleepy Eye Telephone Company, has resigned to accept a position with the North American Telegraph Company at Minneapolis. His place at Sleepy Eye has been filled by the appointment of his former assistant, Michael Fohl.

Harry Alexander, who has been with the Inter-State Telephone Company for the last year, leaves Plainfield and will go to Geneva, where he will enter the employ of the Chicago Telephone Company.

Roy F. Mapes, who came to Battle Creek as a special representative of the Citizens' Telephone Company, is now the manager of that telephone company in this city, succeeding J. C. Laraway, who takes another position with the company.

The following promotions have been announced by W. B. T. Belt, general manager of the Nebraska Telephone Company, effective November 15: L. B. Wilson, commercial superintendent of the Nebraska Telephone Company, to be assistant to G. H. Pratt, general commercial superintendent, with the title of special agent. F. A. May, district manager at Grand Island, to be commercial superintendent to succeed L. B. Wilson, promoted. E. C. Hartley promoted from commercial agent to the newly created position of commercial engineer.

NEWS FROM THE FIELD.

ALABAMA.

The Southern Bell Telephone Company has purchased three lots on Johnston street, Albany, and will soon begin the erection of its four-story exchange building.

Work on the new cable from Bessemer to Birmingham, being put in by the Southern Bell Telephone Company, is progressing rapidly and will be completed in the near future. This additional cable is to carry fifty-one lines and will greatly facilitate the handling of the large volume of business between the two cities.

Books and records of the Southern Bell Telephone and Telegraph Company will be examined bv the representative of the city of Birmingham in Atlanta, at the company's office building, instead of at Montgomery. The Alabama public service commission, at its session in Montgomery, approved of this plan which was submitted by the telephone company and agreed to by the city of Birmingham, through commissioner James Weatherly and city attorney M. M. Ullman, according to advices received in Birmingham from Montgomery. The examination will start about November 20, and will be made by Alonzo P. Richardson, of Atlanta, representing the city of Birmingham.

ARKANSAS.

W. L. Conine of Colorado has purchased the Brown telephone line at Gillett and will begin improvements at once in the system, which extends over Arksansas county.

The privately owned telephone line to Kibler and Catcher will be improved.

The Southwestern Telephone Company has completed a copper line into Rush. Work will be started on a line from Bergman to Harrison.

CALIFORNIA.

Ten thousand dollars will be expended on improvement and

extension of the Modesto system of the Pacific Telephone & Telegraph Company, and plans and specifications have been received by Manager Edward Garner. The specifications call for construction of three new lines from Modesto to neighboring towns. A main line will be built to the Santa Fe, east of Modesto, and three branch lines will radiate to Oakdale, Empire and Hughson. The main toll line to Newman will be entirely rebuilt and new poles and wires will be used on all lines.

The cables are being attached to the new switch board at the telephone building and work will soon be begun on the underground wire laying, which will take about one month, after which Sanger will boast of one of the most modern and best equipped telephone systems in the valley.

The laying of underground cables in the downtown section of Long Beach will be completed by December 31.

The Pacific Telephone and Telegraph Company will make improvements in its Richmond service which will add an enlarged area to the Richmond exchange, costing $7,000.

CALIFORNIA.

A deed from the town of Hillsboro to the Pacific Telegraph and Telephone Company for property on Floribunda and El Camino Real has been made. The erection of a main exchange for San Mateo, Burlingame and Hillsborough will now proceed. George H. Howard is the architect and the plans call for a two-story mission building with all modern conveniences.

The Pacific Telephone and Telegraph Company has a construction crew of ten men at work setting poles and extending service to the Los Altos Orchard Acres tract, where several new homes have recently been completed.

The telephone exchange in Springville has been moved from the drug store to the store of Peabody & Huhhs.

After obtaining an appropriation of $400 from the Department of Agriculture to be added to a donation of $300 from the city of Pasadena, for the construction of a telephone line from Pasadena up the Arroyo Seco for a distance of nine miles, R. H. Charlton, supervisor of the Angeles National forest, announced that construction on the new line would begin immediately.

The Pacific Telephone and Telegraph Company has $20,000 worth of copper wire and other materials stored in Los Banos, to be used in stringing two additional wires through the West Side from Fresno to Gilroy, in order to improve the service between the Valley and San Francisco. Work of construction will begin about the first of the year.

ILLINOIS.

The Farmington Telephone Company is planning the erection of a new building.

The Mason City Independent Telephone and Telegraph Company has placed an order for a modern switchboard for their central office; a board with numerous improvements over the one now in use and with almost double the capacity. In addition to the switchboard new long distance booths will be installed and other improvements made.

The Breckenridge Telephone Company reports that the month of October, 1916, was the greatest, both in local and long distance business in the history of the company.

A new telephone exchange building has just been completed at Manchester for the Illinois Telephone Company. It will be occupied about December 1.

The Monmouth Telephone Company is completing improvements to the extent of approximately $2,000, which will better the local and long distance service. They include the installation of a new storage battery and the laying of several hundred feet of cable wires.

The telephone company in Batavia are placing wires underground on Wilson street hill at the corner of Batavia avenue.

ILLINOIS.

Plans have been discussed by equipment superintendent Wallace of the Central Union Telephone Company and district manager Taylor for doubling the long distance service facilities of the company in Jacksonville. Room for six operators' positions will be arranged and put into effect January 1.

At the annual meeting of the stockholders of the Farmers' Mutual Telephone Company of Ogden, held October 21, the following officers were elected: President, Henry V. Cardiff; secretary, Albert Anderson; directors, Arthur Hays, D. E. Helton, and Patsy Daily. Directors whose terms did not expire this year are: James Elder, James Skinner and Tip Silkey. Mr. and Mrs. Edward Fiscus were employed to have charge of the telephone office for another year.

The Chicago Heights exchange of the Chicago Telephone Company is planning extensive improvements.

The Bell telephone exchange at Mechanicsburg burned November 7, entailing a loss of several thousand dollars.

The stockholders of the Dahlgren Peoples Telephone Company held their annual meeting and elected Al Kreher, president; H. S. Sneed, vice-president; W. D. Dale, director; J. B. Koons, secretary; and W. E. Taylor, treasurer.

The new switchboard for the Commercial Telephone Company in Mt. Carmel has arrived and will be installed in the new exchange building in East Fifth street at once.

A permit to incorporate has been issued at Springfield to the Macon Telephone Company of Macon to engage in a general telephone business. The capital is $12,500. The incorporators are E. S. Sterrett, C. B. Cheadle and Ben B. Boynton.

Due to the great increase in the toll departments operating out of Galesburg the Central Union Telephone Company has added a number of new circuits connecting with cities which are already on the exchange.

INDIANA.

The Central Union Telephone Company, under supervision of Foreman Miller, is consolidating the leads of the New Home and Central Union companies between Linton and Jasonville. New poles and other material are being used in the construction and the consolidation will mean a better, more substantial lead, and better toll facilities.

The Winona Telephone Company has acquired the telephone plant at Francesville. It will be improved.

A special meeting of stockholders of the Eureka Telephone Company will be held at Corydon, December 2, for the purpose of filing amendments to the Constitution and By Laws of said company.

The contract for a three-story exchange building has been awarded by the Central Union Telephone Company to the W. P. Jungclaus Company on a bid of $38,100. The building will be situated on Belmont avenue, near Washington street, Indianapolis, and will house the property and employes of the Belmont exchange. The building will have a frontage on Belmont avenue of forty-four feet and will extend back seventy-eight feet. The exterior will be of mat-face brick construction, giving it a tapestry effect. The entire structure is to be completed within 110 days, according to the terms of the contract.

IOWA.

Underground cables are replacing the aerial cables belonging to the Western Electric Telephone Company in Mason City. Work has also been started on the installation of the $50,000 switchboard.

The Millerton Telephone Exchange Company held a meeting and the following officers were elected: Directors, F. D. Brewer, J. N. Stark, George Stech, O. B. Walmer; secretary, Hoy Patterson; treasurer, J. M. Morrett. The directors will choose the president from one of their number.

Beginning November 6 the Rural Union Telephone Company inaugurated an all day Sunday telephone service in Humboldt.

The telephone line over to Waterman, and beyond, has been rebuilt.

A public telephone booth has been installed in the waiting room of the Interurban in Mt. Vernon.

The Blue Earth Valley Telephone Company sold its telephone exchange at Peterson, Iowa, to the Western Electric Telephone Company at Mason City.

KANSAS.

Workmen for the Missouri & Kansas Telephone Company are at work making additions to the cables in the alleys along Main street and increasing their capacity in Hutchinson. A new conduit and cable is also to be laid on Third avenue east and another between Avenues A and B east of Main.

KENTUCKY

The Cumberland Telephone & Telegraph Company are replacing old wires and cables in Paris and Winchester, under the supervision of M. K. Chowning.

S. Davis Hughes of Winchester on November 1 took charge of the Hazard Telephone Company, which he recently purchased from the private corporation controlling the affairs of the concern. Mr. Hughes is planning to improve the property to the extent of about $10,000. The lines of the Hazard Telephone Company extend through Breathitt, Leslie and Perry counties and the only system connecting the mountain counties with the outside territory.

The Home Telephone Company in Shelbyville has issued its first directory since the fire destroyed the plant in April of this year and has increased nearly two thousand subscribers since the last directory issued in December, 1915.

MARYLAND.

The Chesapeake and Potomac Telephone Company of Baltimore City held a conference on November 10 at Salisbury. It was attended by all of the employes of the commercial department of the Southern Eastern Shore District. A banquet was held at the Central Hotel.

MICHIGAN.

Extensive improvements in the Lake Linden-Hubbell telephone system are contemplated by the Michigan State Telephone Company and it is likely the work will begin early next spring. No definite announcement of the proposed changes has been made however, but assurance is given that the project will entail an extremely heavy expenditure.

The Girls' Social Club of the Michigan State Telephone Company, Detroit, held a carnival November 9, 10 and 11.

Automatic telephones will be installed in Hastings by the Citizens Telephone Company of Grand Rapids at an expense of $40,000. The new exchange will be located in the Mulholland block and will be opened April 1. The company was granted a slight increase in rates on condition that this system be installed, citizens of this city agreeing to the increase at the meeting in Lansing.

Representatives of the Bell Telephone Company are making a commercial study of the city of Mt. Clemens.

Ypsilanti Home Telephone Company, of Palo, capital stock increased from $50,000 to $75,000.

The directors of the Citizens Telephone Company, Grand Rapids, at their meeting November 9 executed the authorized $3,000,000 mortgage to be used as a basis for bonds to be issued. Of the authorized amount only $720,000 will be taken down at this time. The mortgage will be filed in Kent county for the payment of the state tax and in twenty-seven other counties where the company does business as a matter of record. The new bonds will be ready about December 1.

The Bell Telephone Company employes, Grand Rapids, held their fifth annual charity ball, November 15. The proceeds of the dance will be used to purchase food to be distributed among the city's poor at Thanksgiving.

MINNESOTA.

The Excelsior exchanges of both the Tri-State Company and the Northwestern Telephone Exchange Company were destroyed by a recent fire. However, the damage has been repaired and communication with the outside world has been resumed.

William S. Williams, local manager of the Tri-State Telephone Company, announced that Saturday night, November 18, will see the "cutover" in Minneapolis from the manual to the automatic service.

The Northwestern Telephone Company suffered a loss to poles amounting to $300 in a fire in St. Paul which did considerable damage.

A new switchboard is being installed at the Echo exchange, also underground cable.

The Tri-State Telephone Company has purchased the property occupied by the telephone exchange at Wahkon and work has commenced on an addition to the building.

The Tri-State Telephone Company has a crew of men at work installing phones at Barrows.

The people of the Prairie lake district are agitating the establishment of a rural telephone line into that section.

The remarkable increase in the number of telephone subscribers in Houlton has made it necessary for the Aroostook Telephone & Telegraph Company to install one of the most modern switchboards in the central office in the Millar Block, Court street.

MISSISSIPPI.

Work on the handsome new home of the Cumberland Telephone Company in Vicksburg is progressing nicely, and soon as the finishing touches are put on it will be opened to the public as one of the costliest and most modern structures of its kind to be found in any city of the size in the country.

MISSOURI.

Installation of a new system of ringing the four-party lines of the Forest exchange of the Bell Telephone Company in St. Louis, has necessitated changing the numbers of 1,200 four-party Forest subscribers and has made possible the abolishment of the Monroe exchange. The 500 subscribers of the Monroe exchange have been absorbed by the Forest exchange, with new numbers.

About fifty Bell telephones were put out of commission by a fire which destroyed four barns in the rear of 2307 to 2309 East Eighteenth street, Kansas City.

Webb City is to take steps in an attempt to prevent the Home Telephone Company from raising its toll rates between Webb City and Joplin and Webb City and Carthage.

MONTANA.

The completion of 26 miles of telephone on the Helena forest near Townsend gives the reserve a complete system of 150 miles connecting all but two of the nine permanent ranger stations. The last 26 miles connects the Benton ranger station near Watson with Townsend.

Within thirty days the Mountain States Telephone and Telegraph Company will complete the work on the $400,000 estimate undertaken to care for Butte's growth and to complete the consolidation of the old Independent and the Bell systems, according to H. E. McAfee, district manager. The high telephone poles which were on Main street for years have been stripped and will be taken down. The underground cable system and the use of poles in alleys will replace the pole lines on busy streets.

The two telephone systems in Columbia Falls have consolidated.

That the Moore Telephone Company is progressing with the Glasgow-Glentana line, is the report brought here by Manager R. J. Moore, who was at Glentana recently in connection with the new line.

NEBRASKA.

The Nebraska Telephone Company is constructing a toll line from Lyons to Emerson at a cost of over $2,000.

Three of the Nebraska Telephone Company chiefs, with their staffs, moved from the telephone buildings, Douglas street, Eighteenth to Nineteenth, Omaha, November 15, and took quarters in the sixth and seventh floors of the Brandeis building. These are E. I. Hannah, division plant superintendent; J. R. Carter, superintendent of traffic, and L. B. Wilson, commercial superintendent. Building the projected four-story addition to the telephone building is presumed to have been put over to next year, due to the cost of building material.

NEVADA.

An addition of two sections of switch board to the present equipment of the telephone company in Reno will be made by the middle of November. The new additions will occupy larger space and it will be necessary for the business office to be moved to the Masonic Temple in the rooms formerly occupied by the Ingalls-Heaton Company. The present office will be closed to the public and will be used only for the mechanical end of the business.

NEW JERSEY.

Cuban-American Telephone and Telegraph Company to operate telephone and telegraph stations, incorporated at Dover, N. J., with capital stock of $2,500,000.

NEW YORK.

The work of rebuilding the entire telephone system in Clinton by the New York Telephone Company has been started.

As a site for a new telephone exchange building the New York Telephone Company has purchased from various owners the nine old dwellings at 206 to 222 West Thirty-sixth street, fronting 165.3 by 100 deep, between Seventh and Eighth avenues, close to the Pennsylvania zone center, New York. Plans for the new building are being designed by McKenzie, Voorhees & Gwelin.

The Dundee Telephone Company has installed a new toll line from Dundee to Bradford and subscribers on the Dundee-Bradford line and subscribers who live between Tyrone and Bradford have now been connected up with the central office at Bradford.

The New York Telephone Company announces that a new telephone central office will be opened under the name of Bowling Green. The Bowling Green central will serve the territory south of Rector and Wall streets jointly with the Broad and Hanover central offices, New York.

The New York Telephone Company is laying a new submarine cable between Tarrytown and Nyack. The cable stretches from Main street to a point below Peterson's boat works in Nyack. It is the largest cable north of New York City.

NORTH DAKOTA.

The Farmers' Mutual Telephone Company of Lunds Valley are repairing its line.

Eckman Farmers' Telephone Company, Eckman, $25,000; Charles E. Bercker, Henry J. Hehl, C. G. Faten.

A deal was consummated at Center whereby L. D. Munson sold his local telephone exchange to the Oliver-Mercer Telephone Company.

A new switchboard and rack have been installed in the telephone office at Litchville.

The telephone line from Mandan to Yucca has been sold by the North Dakota Independent Telephone Company to several other men. This line has heretofore been operated on a toll basis and from now on will be operated without toll charges.

OHIO.

The new equipment for the Portage County Telephone Company, Kent, has been delayed and therefore cannot be put into service until January 1.

An automatic switchboard is to be installed in the court house at Youngstown by the Ohio State Telephone Company, the contract having been closed with the county commissioners.

During the month of November the telephone company in Cincinnati opened its doors on Wednesday from 9 a. m. until 4 p. m. to its patrons and the general public.

The Black River Telephone Company, Lorain, has increased its capital from $300,000 to $500,000.

At the quarterly meeting of the People's Telephone Company, held in Stockport, the following directors were present: Emmor Bowman, C. P. Yocom, Will Morrow, George Brokaw, T. J. Lyne, T. G. Harmer, J. M. Barlow and L. S. Holcomb, also the manager, W. H. Penrose, and secretary, Frank Hammond.

A force of workmen employed by the Western Electric Company is installing the new switchboard which recently arrived at the local exchange at Lorain. The new system will transform the exchange to a central energy type.

Notice was served on competing telephone companies at Sandusky, November 8., to halt building plans. Each, the Central Union and the Sandusky Home, contemplated the erection of its own buildings. City Manager K. B. Ward says he hopes to be able to merge the two concerns in the interest of a better service.

Word has been received by the telephone committee of the Chamber of Commerce from the state utilities commission to the effect that the merger of the two telephone companies in Galion had been accepted as far as the rates for phones in the city were concerned. These rates call for $3 a month for office phones and $1.50 a month for phones in private homes. Nothing definite was said about the cost to rural users of the telephone.

Announcement has been made of the proposed arrangements for the consolidation of the properties and service of the Piqua Home Company and the Bell Company following the arrival of a number of officials of the Central Union Telephone Company.

The Shelby Telephone Company, Shelby, has increased its capital from $75,000 to $100,000.

Petitions are in circulation requesting council to order the removal of telephone poles from Oregon avenue Sebring. It is also stated that a like petition will be circulated and signed by residents of Maryland avenue. The telephone company mutilates the shade trees, hence the petition.

Ironton, Nov. 10.—At a meeting of the stockholders of the Home Telephone Company, Ironton, directors were elected and preparations were made for the transfer of the Home Telephone exchange in the Russell building, to the Bell exchange in the Hoffman block at Third and Park avenue. Directors were elected as follows: J. W. Cherry, J. F. Drurkemiller, W. S. Carter, D. C. Davies, F. J. Horschel, F. L. McCauley, Col. H. A. Marting and A. C. Robinson. The directors organized as follows: H. A. Marting, president; F. L. McCauley and A. C. Robison, secretary.

The Odd Fellows building in Medina which housed the telephone exchange was destroyed by a recent fire.

George Bodemael is making an official count and inspection of all the telephone and telegraph poles in Salem. The work is being done under the supervision of City Engineer C. B. McCollough.

The Ashtabula Telephone Service Company, Ashtabula, $10,000; W. R. Flower.

The Bell and National Telephone Companies of Steubenville will merge January 1, 1917, according to announcement recently made.

The Cleveland Telephone Company has taken out a permit to build an addition to its exchange at 2059 East One Hundred and Fifth street and to make interior alterations, costing altogether $50,000.

The new Holden hotel of Dayton which opened formally to the public on November 15 is equipped throughout with the Bell Telephone system. There is a telephone in every room and every department, and also in the parlors and dining rooms.

OREGON.

Articles of incorporation were filed with the corporation commissioner by the Irving-Eugene Telephone Company, with a capital of $1,250. The principal office is at Irving, Lane county.

Proposals were made by representatives of the Intermountain Telephone Company of Burns, at the recent meeting of the Bend Commercial Club, to connect Bend and Burns by a direct telephone line. J. E. Weston, manager of the company, spoke of his plan. It is estimated that the line would cost approximately $12,000. The matter has been referred to the Commercial club for consideration.

Union Telephone Company, Irving, $1,000; W. Polders, E. W. Zumwalt and C. P. Barnard.

PENNSYLVANIA.

The Mutual Telephone Company, by the Stader-Conrath Construction Company, obtained permit for the erection of two 40x40 foot additions to the rear of the building and exchange at 19-21 East Ninth street, Erie. Steel and concrete will be used. The cost is estimated at $11,800.

Taking effect November 1 the toll rate between Harrisburg and Millersburg has been reduced from twenty-five to fifteen cents as announced by S. B. Watts, local manager of the Bell Telephone Company of Pennsylvania. The rate was also reduced between Harrisburg and Steelton effective November 21.

The regular monthly meeting of the Petroleum Telephone Company was held in Titusville and the matter of switchboards and other appliances for the new building were discussed.

Improvements costing more than $120,000 have been begun in the Bell Telephone Company's new building being erected on the southwest corner of Wyoming avenue and Division street, Kingston. Excavations were begun in September and it is believed that the building will be ready for occupancy by the first of the new year.

The Bell Telephone Company has a force of men at work rewiring and making the necessary preliminary changes in moving their local exchange from the Ray restaurant property to the house of E. A. Henry on East Main street, Annville.

Work of placing certain of the Bell Telephone Company wires underground at Pottsville has been started. Contract calls for completion by December 1.

The Bell Telephone Company manhole covering at Beech and Penn streets, Pottstown, has been raised to conform to the grade level following a complaint made to council.

For the construction of multi-party lines from Boalsburg to Pine Grove Mills, from Boalsburg to Galbraith Gap, and also for the building of toll lines and circuits to serve Bell telephone subscribers within the Boalsburg exchange area, the Bell Telephone Company of Pennsylvania has appropriated more than $7,500.

The Bell Telephone Company, Philadelphia, will place additional equipment in the Woodbury central office, costing $33,000.

Extensions and additions to the plant facilities in Boyertown are being contemplated by the Bell Telephone Company.

SOUTH DAKOTA.

Articles of incorporation have been filed for the Crooks Telephone Company at Crooks. Capital $10,000. Incorporators, A. R. Crooks, E. A. Severin, Albert Johnson.

The board of directors of the Plankinton Telephone Company closed a deal for the purchase of the F. M. P. A. building on upper Main street.

The switchboard has been installed in the new telephone exchange at Loomis.

TEXAS.

An independent rural telephone company has started to place phones in Westfield, Spring, Steubner, Lometa and other points. Professor O. Mueller of Spring is secretary of the company.

A company composed of employes of the Southwestern Telegraph and Telephone Company in Ft. Worth presented "Any Girl," an allegory for every woman who works. It was staged in the high school auditorium.

The annual general managers' convention of the Texas Telephone Company was held in Waco, November 16. A large attendance was present.

VIRGINIA.

By the first of the year the handsome and modern home of the Bell Telephone Company in Wheeling will be complated. The four-story fireproof structure on Chapline street, opposite the court house, is to be one of the finest telephone plants in the country.

WASHINGTON.

The first regular monthly meeting of the Telephone and Telegraph Society, composed of male employes of the Home Telephone Company, for the season of 1916-1917, was held on the eighth floor of the telephone building, Second and Stevens streets, Spokane. A paper on sickness and accident compensation as exemplified by the plan for sickness and accident disability benefits was presented by D. E. Beavon.

A franchise for the construction of telephone lines and facilities in the vicinity of Stanwood has been granted by the county commissioners after a brief hearing. The People's Telephone Company will construct the lines and will maintain headquarters at Stanwood.

Rehabilitation of the defunct Sound Telephone & Telegraph Company, operating telephone lines between the mainland and the islands east of Tacoma, is the object of A. and M. Ohlson of Tacoma and W. J. King of Lake Bay, who recently filed articles of incorporation for the company at Olympia. The capitalization of the new corporation is $10,000. The telephone line connects Joe's Bay, Vaughn, Lake Bay and numerous other communities with the mainland south of Tacoma.

As soon as material can be assembled work on the installation of telephone lines south of South Forty-eighth street and west of Sheridan street, Tacoma, will be undertaken by the Pacific Telephone & Telegraph Company, according to an announcement of Manager John Schlarb.

The Pacific States Telephone Company's new line between Molson and Oroville is completed. The crew is now engaged in extending the line to the British Columbia line to connect with the British Columbia Telephone Company line.

A franchise for the construction of telephone lines and facilities in the vicinity of Stanwood has been granted by the county commissioners after a brief hearing.

Before buying cables

ask for prices on STANDARD cables. They stand for over 30 years of experience in the manufacture of high grade telephone cables.

Write our nearest office

Standard Underground Cable Co.
Pittsburgh, Pa.

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FIBREX TREE WIRE

FIBREX TREE WIRE is a rubber insulated, copper conductor protected by a serving of tarred jute, one non-metallic tape and a weatherproof braid such as is applied to Simplex Wires and Cables for outdoor service. The total thickness of this protection is about 5-32".

FIBREX TREE WIRE is distinguished by a treated fibrous tape which is exceedingly tough and resists wear far better than any non-metallic protection previously applied to tree wires. This tape is applied in the same manner as steel tape and does not interfere with the flexibility of the insulated wire. It has the advantages of steel tape without its disadvantages.

FIBREX TREE WIRE is absolutely non-inductive. It is not a menace to workmen on or near the lines, because the fibrous tape can carry no dynamic or static charge.

FIBREX TREE WIRE will often save the expense of tree trimming. Tree insulators or battens are unnecessary.

FIBREX TREE WIRE is less expensive than some of the protective devices ordinarily used. It can be jointed to the line wire easily and safely.

FIBREX TREE WIRE is weatherproof. Regardless of weather conditions grounds do not occur with their consequent dangers. There is no leakage over the fibrous tape and a uniform line voltage is preserved.

FIBREX TREE WIRE is made for all commercial voltages.

Ask for Sample and Prices.

SIMPLEX WIRE & CABLE Co
MANUFACTURERS
201 DEVONSHIRE ST. BOSTON
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1635

AWARDED PANAMA PACIFIC GRAND PRIZE

W & M Telegraph and Telephone Wire.

Strand and Pole Steps.

Made by
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Diamond Specialties

DIAMOND CRIMPER

For securely crimping Aerial Rings to Suspension Strands.

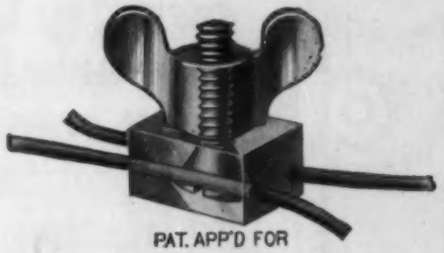
Enormous Power

Convenience in operation is one of the principal points considered in the design of this tool.

Each tool furnished with three sets of case hardened jaws to suit different diameters of messenger strand.

DIAMOND TEST CONNECTOR

Simple, Efficient and Secure



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Easily manipulated as the block is in one piece with no small, loose parts to be lost.

Small and large wires can be connected at the same time in opposite sides of Connector.

Wires are enclosed in the block and protected from the action of the elements.

No tools required after making connection.

Diamond Expansion Bolt Co.

Manufacturers Diamond Specialties

90 West St. **Corner Cedar St.** **New York**

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EQUIPMENT FOR EVERY ELECTRICAL NEED
Member Society for Electrical Development. "Do it Electrically"

To the Membership of the United States Independent Telephone Association

Our exhibit at the Convention to be held in the Hotel La Salle, Chicago, Illinois December 5, 6, 7, 8 will be the largest and most comprehensive that we have ever shown.

In appreciation of the courtesy shown by the Association in giving over half of each day to the inspection of exhibits, we have aimed to make our exhibit a place where every telephone man may spend his time profitably in a close man-to-man examination of the highly-developed apparatus which we have produced since the 1915 Convention.

One of our most striking exhibits will be an elaborate circuit board which will show every step of the operation of our automatic feature "Central Energy" switchboard circuits in such a clear, simple manner that even the beginner will understand.

These switchboard circuits represent the latest practice in telephone switchboard engineering with which every Convention delegate should be thoroughly familiar.

We will also show our latest developments in both Central Energy and Local Battery non-multiple switchboards and subscribers station equipment with interesting studies of the many processes involved in their production at our factory. Our traveling representatives and many executives of our Company, including those formerly associated with the Garford Manufacturing Company, will attend the Convention. The most educational exhibit and a hospitable reception awaits you in Rooms 1712, 1713, 1714 and 1715. Come!

Stromberg-Carlson Telephone Mfg. Co.

Rochester, N.Y. Chicago, Ill.

Kansas City, Mo. Toronto, Ont.

Successors to the telephone business of the Garford Mfg. Co.

"The Biggest and Broadest

In designing the Automatic display at this year's Chicago Convention we have aimed to make it the biggest and broadest collection of progressive telephone ideas that will be presented there. A few of its more important features are outlined below.

Big Town Service for Small Exchanges

Practically every Telephone Company in America is facing the very serious problem of giving adequate telephone service to its subscribers living in small towns.

There was a time when these patrons were thankful to receive any sort of service, no matter how slow or inaccurate or imperfect it might be. But that condition is rapidly passing and today the companies are facing insistent demands for good service, continuous service, rapid service, and at the same time it is becoming more and more difficult to obtain operators and they are receiving higher wages than ever before.

The telephone companies are being squeezed between the upper and lower mill stone, but some of them are finding the way out.

How are *you* solving this problem?

We have a solution that really avoids all the difficulties and expense. It is in successful operation in various sections of the country.

Our exhibit shows exactly how this is being done.

If you are facing this problem come in and see what we offer.

Real "Rapid Fire" Service on Toll Lines

There are only two ways of making your toll lines more profitable. Your rates are fixed by law, or at least you would find it very difficult to raise them. Therefore, in order to earn more on your long distance service, you must secure more business, and you must keep your lines occupied *profitably* more of the time.

Numerous companies have accepted our suggestions as to the best way to do this, and our exhibit this year shows you how they are increasing their toll profits.

If you offer superior service, real "rapid fire" service, your patrons will give you more and more of their business.

If you can handle toll calls more quickly by reducing the time necessary to set up connections, you can handle more business over your present trunks.

Both of these will help your toll lines earn more money for your company. It will be worth your while to visit our exhibit and learn how others are doing this.

AUTOMATIC ELECTRIC COMPANY :: CHICAGO

Exhibit at the Convention"

We realize that the telephone men who gather in Chicago next month will be very busy, but we feel justified in asking them to visit our exhibit. No matter what kind of exchange you may operate, you cannot afford to miss our display.

The Easy Way to Maintain Good Service

Eternal vigilance is the price of reasonably good service, but keep "on the job" as much as you will, still the camplaints pile up.

You are on the jump all day long, "shooting" this trouble and then that, but the subscribers always have some sort of a kick.

The fault is not with you, but with your system. You *chase* trouble after it has happened instead of *stopping* it before it gets started.

There are a great many telephone companies in America that are using this same hard and costly method, but there are others which have learned the easy way to maintain good service.

The men in their switchrooms do not spend their days skipping about correcting faults but instead they follow certain routines which eliminate subscribers' complaints almost entirely.

Would you like to know how "the other fellow" keeps his "troubles" down to one per telephone per year?

If you will call at our exhibit we shall be pleased to show you some interesting facts and figures, and explain fully the easy way to maintain good telephone service.

Real Economy in Buying Supplies

You would naturally expect a great coffee merchant to serve pretty good coffee at his own table, wouldn't you?

It is quite likely that a large tobacco grower smokes good cigars.

The makers of fine wines usually drink only the best of their wares.

Well, so it is with "Raven Brand" Telephone Supplies. This is not a "trade" line, gotten out to *sell*, but a line developed to meet our own needs as manufacturers. "Raven Brand" supplies are "private stock" and we offer them to you simply because the capacity of our plant is greater than our own requirements, and it is better for us to manufacture at capacity and sell the surplus at a close margin, than to cut down our production.

We use "Raven Brand" supplies in the equipment we send out. Our whole reputation is dependent on these supplies and we can't afford to put out any but the best.

This situation means that you can buy first-class supplies at very close figures, it means Real Economy in Buying Supplies.

Our exhibit will contain complete samples of all our "Raven Brand" line of cords, cables, wires, condensers, telephones, parts, etc.

It will be a pleasure for you to look them over, and profitable to note our prices.

CONVENTION HEADQUARTERS
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Telephone Testing Sets

IN ROOM 1751

The Recognized Standard

THOMPSON-LEVERING COMPANY

PHILADELPHIA, PA.

TRADE ELECTROSE MARK
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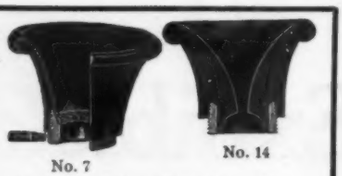

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Safety Strain Insulators, Line Insulators and all other types of Insulators for use in connection with telephone lines, transmission lines, electric railways, etc., etc.

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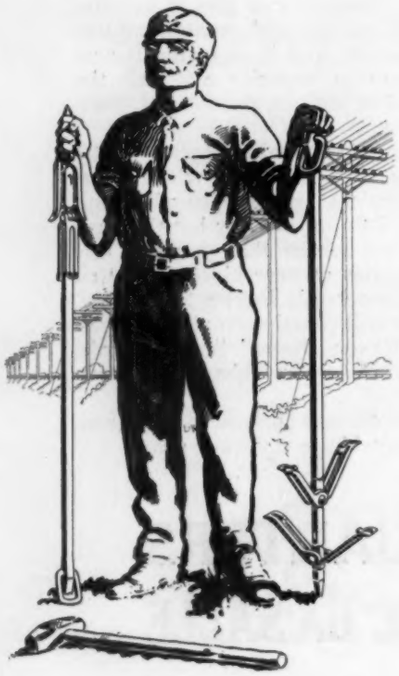
The Man Who Uses

HARPOON GUY ANCHORS



Will tell you they are best because they install easiest, last longest and can not be budged by any legitimate strain of pole line service.

He will also tell you that one man with a sledge can drive (no digging necessary) the "Harpoon" in five minutes and that the first pull upward opens the wings in solid earth.

If you let him talk longer, he will add that other good features of the "Harpoon" are that it has no loose parts to get lost or be forgotten; that no special tools are required—just a sledge and a man to swing it; that it comes nearest to being the universal anchor, as it can be driven and will hold in any kind of soil, but muck, and that it can be used wherever there is ground space to receive the anchor's point and head room to swing a sledge.

Write to us and we will tell you how you can prove these facts at very little expense to yourself

CROUSE-HINDS COMPANY

SYRACUSE, N. Y., U. S. A.

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A Grabaphone for Every Telephone Service

Telephone service is made better as it is made simpler, as lost motions are done away with and unnecessary apparatus is discarded.

The act of telephoning is the more attractive when you get your party with the minimum of exertion, physical and mental.

In early telephone days considerable gymnastic effort, both of muscle and brain, was usually necessary for a successful conversation.

Each succeeding improvement of the telephone brings the talking parties nearer together in the easiest way.

The stand of this set is uniform with our indestructible desk telephone. It has heavy pressed steel cradle, convenient and practical.

Height 7 inches
Length 10¼

Kellogg Grabaphone with No. 111 Stand

To the present time perhaps the desk stand is the most convenient telephone apparatus. Now the sensible, practical and efficient Kellogg Grabaphone further dispenses with a vast amount of effort required in the act of telephoning.

The right or left hand is always free, for writing, for instance.

When you want to telephone; from any position, standing, sitting or reclining, the subscriber can

"GRABAPHONE!"

and talk, with the slight movement of one arm, and that is all. No need of holding a desk telephone in one hand and a receiver in another. No need of balancing a portable telephone on an arm chair and straining one's neck, to complete the connection, or of leaning awkwardly over inkwells and papers, at your desk in a distracting way.

With the Kellogg Grabaphone giving excellent transmission the subscriber can be standing in a hallway, sitting at a desk, reclining in a Morris chair or resting peacefully in bed, and a quiet, clear conversation is not only possible, but is always a certainty.

Code No. 111 Grabaphone, illustrated above, is designed and built for the proper sending of the voice telephonically, and in the most convenient manner.

Code No. 111 Grabaphone can be furnished with any of our standard bell boxes. Several of these are illustrated on the last page of this description.

Kellogg Grabaphone Mounted on Standard Subscriber's Sets

Height, of back board, 25¼ inches.
Width, 8¾ inches. Depth, at writing shelf, 9¾ inches.

The Grabaphone has many advantages, and used in connection with the compact oak wall set, as illustrated above, proves a most convenient and successful style. Standard apparatus throughout with the durable pressed steel cradle arm at the top of the instrument with writing shelf in convenient position. This telephone appeals to many managers, and will satisfy the most cranky kicker in your exchange.

KELLOGG Grabaphone is the ultimate telephone efficiency for the subscriber, and the last word in practical apparatus for the manager. Whether this subscriber lives in a palace or is a tradesman on a side street, we have a Grabaphone adapted to his particular service.

Kellogg Grabaphone saves useless exertion, conserves nervous energy, and enables subscribers to give their best attention to the business in hand which they are transacting over your telephone equipment.

All of Kellogg Grabaphone equipment and circuits are standard and are identical for the service required with our unequalled desk stands in both magneto and common battery exchanges.

The Grabaphone offers a unique service in towns where competition is a consideration, in that subscribers once using this instrument vastly prefer it in many cases to the standard types, and especially preferred as compared with the semi-obsolete equipment offered by competitors.

One reason for the further superiority of the Kellogg Grabaphone in actual service is that the transmitter is always held by the subscriber without effort or thought in the correct position for the best transmission.

The Kellogg common battery Grabaphone is as efficient as is our famous No. 97 induction coil condenser desk stand, likewise the Kellogg local battery Grabaphone has the same efficiency as the well known Kellogg magneto telephone circuits. The Kellogg Grabaphone is 100% efficient.

Kellogg desk type Grabaphone has the particular advantage of being portable, compact and as light as consistent with design.

With these exceedingly attractive improvements and an up to the minute telephone, a higher rental can be charged.

Experience has proved that the public in general is benefited and actually more satisfied with this type of modern telephone.

As portable sets, bedside, or extension telephones Kellogg Grabaphones are particularly adapted.

Kellogg Grabaphone with unit type stand, containing induction coil, condenser, ringer and switch

The base of the unit type set is of heavy pressed steel with the Kellogg durable enamel finish and contains standard equipment for its particular type of service.

Also, the bell being entirely enclosed, gives even more reliable service, as tampering is impossible. Paper or other material cannot be placed under the gongs, or the latter removed, etc.; likewise the clapper is out of the reach of meddlesome subscribers.

Another advantage of the unit type set is that the bell being in the stand proper has a sure tendency to speed up the service. A subscriber, with a bell in the telephone close at hand, will hasten his answering of calls.

Kellogg unit type Grabaphone, as illustrated above, is the last word in compact common battery subscriber equipment.

In all the types of Grabaphone stands the switch is of the vertical type, equal in durability to our standard hookswitch.

No. 11C Grabaphone with No. 111 Stand and 75 D. S. Box

No. 11 L. C. Grabaphone with No. 111 Stand and 2328 D. S. Box

Nothing we can say will be so convincing as a trial order for one or more sets—today

The receiver shell, the handle, the transmitter and the mouthpiece are of heavy Kellogg Bakelite; indestructible in ordinary telephone service. Repeated and long continuous tests prove telephoning with Kellogg Grabaphones equal to any service over desk stands or wall apparatus.

Order two or more styles of Grabaphones to-day. Try them out in every way, and the truth of the arguments here presented will appeal to you.

The Kellogg Grabaphone has a particular appeal to people of refinement and wealth.

It is distinctive, and is an ornament to any room.

This kind of a telephone has been called "foreign type" and indeed has been in service in Europe for a number of years, where it takes preference over any other style.

But above all, it is, to the telephone manager, a means to increase his business and a surety of the highest class service.

Use Is The Test

No. 12 L. C. Grabaphone with Standard Wall Box

No. 12C Grabaphone with Standard Steel Type Wall Box

No. 12C Grabaphone with No. 722 Box for Extension Sets

Kellogg Switchboard and Supply Company

CHICAGO

Branch Offices: Kansas City, Mo., San Francisco, Cal.

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Pacific States Electric Co., Los Angeles, Cal.; Oakland, Cal.; Portland, Ore.; Seattle, Wash.
Northwestern Electric Equipment Co., St. Paul, Minn.

Manufacturers of Standard Telephone Equipment

Western Electric

TOOLS

For the pole crew—the line crew—the cable crew—the repair crew—tools that add at least 100% to the efficiency of the users.

WESTERN ELECTRIC TOOLS are the trustworthy kind—the kind that will stand the rough and tumble wear they will get out on the line.

Pike poles—cant hooks—reels—pliers—cutters—safety belts—Buffalo grips—complete stocks of these and other tools ready for quick shipments.

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EQUIPMENT FOR EVERY ELECTRICAL NEED

Extra Best Best

Extra Best Best (E. B. B.) wire has the lowest resistance of any galvanized wire and comes next to copper for telephone service. Best Best and Steel grades have somewhat higher strengths, steel being the strongest.

The differences go no further in **Roebling** wire. The three grades are galvanized alike. Each is given an extra heavy covering of the best zinc spelter obtainable, resulting in a **durability** impossible in thinly galvanized wire.

JOHN A. ROEBLING'S SONS COMPANY
Trenton, N. J.

Agencies and Branches: New York Boston Philadelphia Pittsburgh Chicago Cleveland Atlanta San Francisco Los Angeles Seattle Portland, Ore.

E C C O
Telephone Wire

has a plus value because of infinite care in manufacture and exhaustive tests on every inch before it leaves our plant.

Made in accordance with Western Electric Company specifications or those of any other customer.

The Electric Cable Company

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Works: BRIDGEPORT, CONN.

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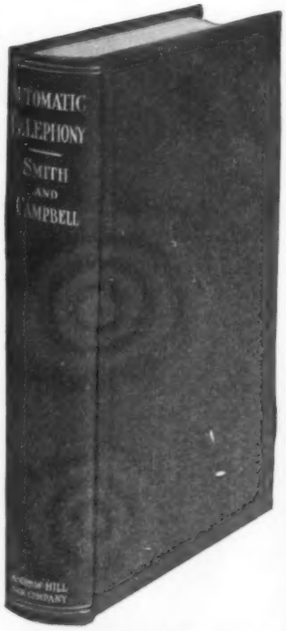

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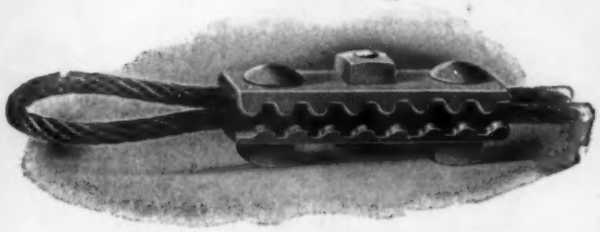

Universal Guy Clamp

In addition to its complete line of protective devices, the Frank B. Cook Company carries certain kinds of line material, of which the guy clamp illustrated above is one. These clamps are made of heavy malleable castings, well galvanized. They cost more than plain clamps but are worth it, because they will stand more than double the strain. This fact has been proved by test.

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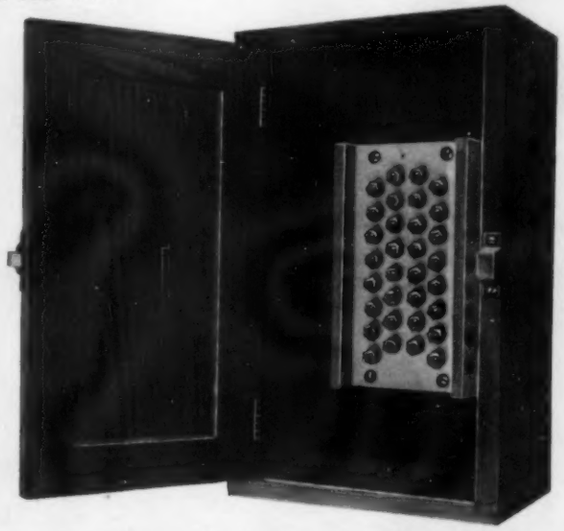

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Notice in the illustration how these posts are mounted on a raised boss in the porcelain. This seems like a small thing, but it is one of those small things that really count, for it insures greater mechanical strength and an increased degree of insulation. Posts cannot turn when the nuts on the outside are tightened.

This terminal is equipped with Cook patent self-soldering nozzle and consequently no pothead is required. Terminal is designed to have the core filled with compound, thus making the entire device absolutely weather-proof as well as fire-proof, as no wood or other combustible material is used in its construction.

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